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JOURNAL
NOVEMBER 1944

IT is a tradition of the *Journal* that the President should write the Christmas Editorial, and I should like to take this opportunity of thanking those members of the profession who have contributed to the *Journal* during 1944. The *Journal* was created, primarily, to show the work, and to provide an organ, for the expression of the ideas of Canadian architects. That is still the chief function of the *Journal*, though British and foreign work fill a larger part of its pages than formerly. It is natural and proper that articles should be reprinted from foreign papers if, in the opinion of the Editorial Board, the importance or interest of such articles outweighs the risk of their being seen twice by a few.

IT would be easy to fill the *Journal* with such articles, but in so doing, we would be departing from the original spirit of the *Journal*, and our own conception of its function. We must always be seeking Canadian articles. No one ever sends us an unsolicited article, but on the other hand, it is only on rare occasions that we are refused an article when it is requested. That is why, during the last few years, we have run, with some success, special numbers, each of which contained a number of specially written articles. To those contributors we are particularly grateful.

WE are sometimes criticized for a poor reproduction, but we have to remind members that we publish only what we receive. The actual mechanical reproduction of illustrations in the *Journal* is of as high a standard as any in Canada. The standard of commercial photography, in the architectural field, is, on the other hand, deporably low. In December, we are fortunate in being able to publish a special number of the work of Mr. Eliel Saarinen. His work is known to every architect, and I wish, here, to draw attention only to the excellence of the photography. Given that kind of photographic material, and the kind of article which we are getting today from the Canadian architect, we could do a journal that was second to none on this continent. I suggest that architects show the December *Journal* to their photographer next time they photograph a building.

THIS is the school issue. Probably, in no field of building, are we likely to see greater changes in the post-war years. Especially will this be so in urban areas. The plan of most of our present older schools was forced upon the architect by a restricted site and haphazard city planning. When a neighbourhood grew up and a school became necessary, a site was found that would take a building and two paved areas — one for boys and one for girls. In the new planning of a neighbourhood, the school site will be the first chosen, and the neighbourhood will be planned about it. As a result, it will be large enough for ample playing grounds and all the activities of a modern school. Because of the size of the site, the school building will have fewer floors than formerly and will cover a considerable area. Two floors will, likely, be a maximum. All rooms will be well lit and well ventilated, and the chances of loss of life in fire will be greatly reduced. To tell a child that "its school days are the happiest of its life" will then have some meaning.

Editor.

NURSERY SCHOOLS NEEDS, PURPOSE, METHOD, PLAN, SPIRIT

By JAMES A. MURRAY

"The social art of architecture affords no theme of deeper import than that of the schoolhouse nor any, unless it be the church, which has suffered a more grievous oppression from laws which had their origin not in society but in the private heavens of architects." —*Joseph Hudnut.*

There is no question but that the modern nursery school is the outstanding example of such an architectural theme, for its concern is the private heaven of the very young. The school's architecture originates and is subtly shaped by laws inherent in the aims and method of the nursery. The need, the purpose and the methods of nursery school education, being somewhat of a new concept, merits detailed examination as a prelude to a discussion of the sympathetic planning of a child's environment. Furthermore, such examination should correct any impression that a nursery school's objective is the growing of shrubs.

"a grievous oppression from laws which had their origin ----- in the private heavens of architects."

The Need and Purpose of Nursery Schools

What has brought to the modern scene the need of a special environment to care for the smaller citizens outside their parental mansions? Principally changing times as the mothers' activities move out of housedresses into office suits, factory slacks or club attire. Furthermore, the development of any living organism is influenced to a very great extent by the condition to which it is subjected in the early stages of its growth, be it a periwinkle or the family's most recent tax exemption. This is especially true in the latter's case. The fundamental needs of young children may be catalogued simply; they are—

1. Fresh air to breathe in and shout out. 2. Ample space in which to exercise growing bodies—*but* 19% of all homes are overcrowded says the Dominion Bureau of Statistics and that is part of the answer. Consider urbon apartment living—gone is the accessible backyard, brothers and sisters with whom to play, grannies and aunties on whom to rely. Even decent normal homes cannot and do not provide everything necessary for all-round development of baby talents. Most families live in small dwellings where space is limited and crowded furniture restricts boisterous activities. Family possessions form a hazardous world of "don't touch" to a three-year-old scientist conducting his own peculiar research. 3. Warmth and shelter—*but* 19% of all homes are substandard and 38% are without furnace heating. 4. Food suitable in type and quality—*but* although we may hope that baby bonuses will alleviate malnutrition due to poverty, young mothers often lack an elementary knowledge of children's nutritional needs and may satisfy hunger with a diet lacking important essentials. 5. Facilities for training in personal hygiene and cleanly habits. 6. Regular and skilled supervision to detect deviations from the normal, either physical or mental, in their earliest stages—*but* although family-doctor visits may be fairly regular they cannot ensure the detection of ailments in their earliest stages since in the first few years a child may be well one day and develop pathological symptoms the next, unseen by the untrained eye. 7. Suitable and adequate provision for the child's psychological needs—*but* between babyhood and school life the child discovers a vast new world and his relationship to it is no longer contemplated from the safe vantage of a crib or baby carriage but as a participant. When the whole environment is designed for adults and a baby is introduced into it, inconvenience results for big people and severe maladjustments for small people—result, repressions and inhibitions. The youngster needs an environment where he can indulge his curiosity, develop strength and, most important, reconcile his legitimate claims with the legitimate claims of playmates—in other words learn to co-operate.

changing times as the mothers activities move out of housedresses into factory slacks.

Some believe that nursery school admission at such an early age as two or three is not in the best interest of child or parent. Nursery experience has shown that, on the contrary, because of the schools' high standards, greater demands made upon the parents arouse more intelligent interest in their child's development. Actually the school is in no sense a substitute for the home, it is a necessary partner where expert training is brought to focus on the child, and if we accept the group from two to five and from five to seven years of age as customers for our schools the Dominion Bureau of Statistics, with its usual uncanny knowledge of presumably unknowables, details the market for us—

Children and what they can do ----- must be the grammar of ornament.

2:30— 3:00—*dressing routine.*
2:45— 3:00—*mid-afternoon nourishment.*
2:45— 3:00—*parents call for children.*

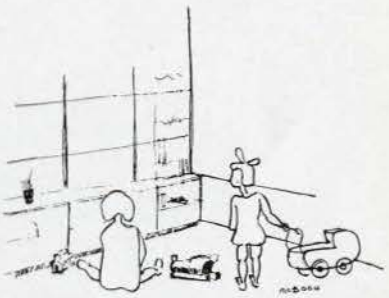
(later hours than this are inexcusable except for the present emergency, otherwise there is no opportunity for real family life) *from "Understanding the Young Child", by Dr. W. E. Blatz.

the architect who tucks away toilets in waste areas of the plan is missing the whole point of the schools direct educational facilities

The Plan

We have examined the need, the purpose, the methods, of the nursery school and can speak of the plan. This "special planning" is the task of the architect who must create buildings, surroundings, equipment, that are intelligently and particularly designed for their purposes. The building should be an architectural expression of an educational philosophy—the philosophy of learning by doing. Certainly hand-me-down houses in which most Canadian nurseries operate are not the answer.

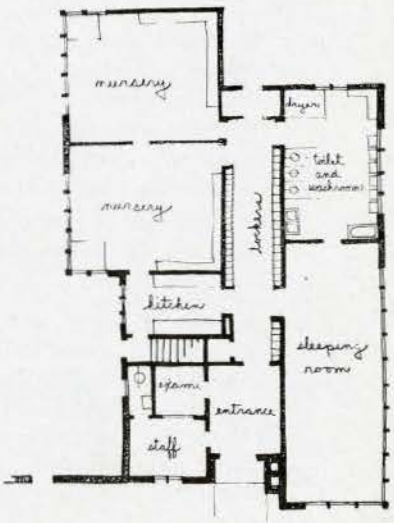
In providing for this very young and very impressionable architectural clientele the plan must recognize that at the beginning the client is barely a toddler while at the end of his sojourn at the school he is ready for the beginnings of formal education. The modern nursery is different from a kindergarten, it cannot be planned as an elementary school—merely reducing the dimensions of a grade school or kindergarten produces a caricature. Little children cannot go far without supervision, they need frequent washing and toileting always supervised. One might say that all the activities of the nurseries' little people are educational—the incidental processes of a later age are central problems of the small child's young life;—changing garments, washing, toileting, are not the incidentals of the educational programme, they are in themselves education. Consequently the architect who tucks away toilets and cloakrooms in waste areas of the plan is missing the whole point of the school's direct educational facilities. Dr. Blatz stresses the adequate planning and location of the washrooms, for, as he suggests, all roads lead to the washroom. And, however tempting the open plan may be this is a rough climate which means the insulating hand in the velvet glove, not to mention provision of a good drying room for clothing subject to snow, rain, and childish emergencies. Remember that the world of little people must not be too large, must not be too complicated, must be of modest dimensions and familiar—this means a single large room with a few dependent areas and few excursions, for once inside the building the small child must remain always within reach of one teacher and one assistant's eyes, ears, and arms. Remember, also, that small children in groups exhibit all the characteristics of quicksilver and are extremely hard to move. And, above all, remember that indoor and outdoor play and rest space are integrated and virtually one, and that the outdoor play space should be neither too large nor incapable of supervision from one station point.



free play period - alone or with others.

From a planning point of view the nursery school may be considered in two parts, the nursery units and the administration unit. A typical unit within a nursery school will have an enrolment of from 15 to 25 children. Usually a school may consist of two such units. Each unit is composed of a playroom (about 25 x 20 feet) with direct access to the garden; low cupboards without doors or drawers; cloakroom; lavatories, and w.c.s adjacent; provision for resting often in the playroom but preferably separately; and storage. The administration block includes corridor, controlled entrance facilities, nurse's examining room, staff rest room, office for headmistress, a kitchen with storage space, staff toilet and if possible a waiting room, an observation room for parents and an isolation room —which incidentally has nothing to do with punishment.

From the child's standpoint, what is desired is a complete compact environment free of outside disturbances, scaled to his capacities. From the teacher's point of view the prime requisite is minimal motion, the least possible cartage of things or babies—ease of supervision.



sketch of an ideal nursery school plan by Marani and Morris, architects

Furniture, Equipment, Playthings

For a youngster anything within reach serves as a toy. Expensive or over-elaborate equipment is unnecessary. Play material in nurseries varies from makeshift equipment to scientifically designed play material covering the progressive stages from 2 to 7 and where such is required special provision will have to be made for storing it away neatly in special cupboards. Details of smaller toys and equipment are outside the province of the architect, but he must realize that ample cupboards of varying size are necessary for storing away these possessions. Furniture should be easy to stack or store and easily moved by children.

Good examples of nesting tables and chairs for nursery use are available. It is intimated that a comfortable fortune awaits the architect who will design a sanitary, light, strong, nursery rest bed. Square nesting tables to seat four children are necessary. Other equipment provided should include a movable swing, climbing rope, a jungle gym, a slide, a see-saw, a blackboard, a poster board, a good piano.

Outdoors, planning for children's needs is more necessary than making a "pretty garden". The following is a list of features suggested in the English book, The Design of Nursery and Elementary Schools—(a) grass play lawn; (b) hard play space; (c) sand pit; (d) paddling pool and, shower with running water; (e) pets, but not too near the playroom windows; (f) flower beds—sacrifice professional gardening for child effort; (g) bird bath and bird house; (h) outdoor toy store; (i) "house"—a roof on three or four supports just high enough for seven-year-olds.

Mechanical Equipment

Most of the nursery school children's activities are conducted on the floor. Consequently, heat should be directed toward floor level, drafts must be eliminated. Exposed heating elements should be equipped with guards to prevent children burning themselves. With these requirements in mind it is obvious that a radiant heating system built into the floor would be most advantageous.

Natural lighting in nursery schools should be as great in quantity as possible. At least one continuous window along one side of the room facing the garden and coming down to within 1 foot, 3 inches of the ground so children may see out is a good arrangement. Artificial lighting should be evenly diffused with a minimum of glare. Panel lighting in the ceiling will remove the source of light as far as possible from the children's eyes.

Floor Coverings, Walls and Ceiling Finishes

Small children live close to the floor so ease of cleaning, warmth, resistance, are necessary qualities of the floor coverings. Cork or rubber asbestos reinforced tiles are excellent; battleship linoleum is a reasonably good substitute but on no account should wood floors be used in children's rooms. For obvious reasons walls should be washable within finger range. Walls and ceilings may well be of different colours but should always be light in tone. Small areas of walls may be treated with full contrasting colours, but in general—although children under five prefer primary colours, full colours should be reserved for toys and movable objects as the school should be cheery and bright rather than exciting. The decoration scheme is very important because very often the nursery school atmosphere leads to the beginning of the formation of good taste in young minds.

The Architectural Spirit

Above all else the architecture of the nursery school must be a setting for child life, a thing of spirit not a product of area arithmetic.

—children and what they can do, not architects and what they can do, must be the grammar of ornament.

—finish and settings must be warm, inviting, intimate, keyed to honest child effort, not such as to make children's work appear utterly crude.

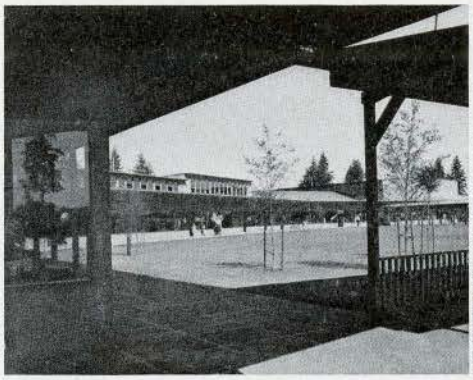
—materials must permit of some abuse and not be easily marred.

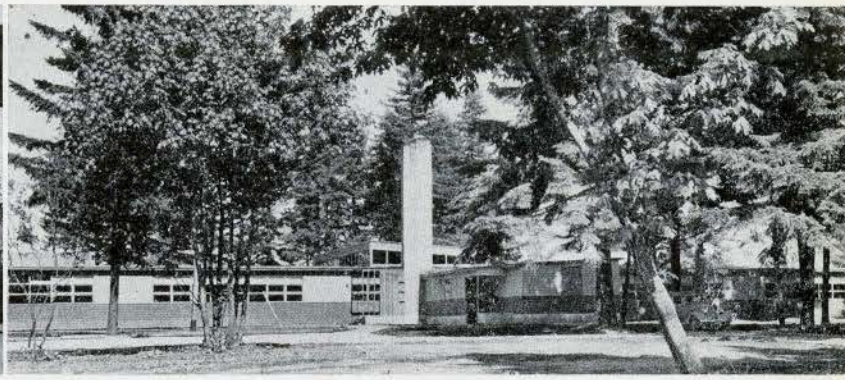
—structure must be honestly obvious to childish eyes.

—lastly, the building must not be too beautiful. It is a place for our younger citizens to use, not to spare.

In an effort to capture the essence and spirit of nursery school education, the scope of its activities, the target of its endeavours, this article has avoided perhaps a "Graphic Standard" approach. However, to lapse from the approach poetic to the approach prosaic there follows a bibliography on Nursery School Design. This is presented with the recommendation that the architect tackling such a commission spend a day in a nursery school gathering his information first hand rather than rely on articles such as those listed below or that which has been written above.

Architectural Record—March, 1938—The Modern Nursery School—Douglas Haskell. February, 1939—A Building Type Study. The English Nursery School—P. E. Cusden. The Design of Nursery and Elementary Schools—H. Myles Wright and R. Gardner-Medwin. Understanding the Young Child—W. E. Blatz.





Commercial centre of McLoughlin Heights offers complete urban business section in area of 50,000 square feet. Schools, like elementary one shown, operate on double-shift. Entire development was planned by 125-man team that worked day and night for six weeks.

THE SCHOOL'S RELATION TO THE NEIGHBOURHOOD

By J. F. C. SMITH

School, according to George Bernard Shaw, was invented by parents to get children out of the house. Indications point to an extension of this function to include the parents themselves! Increasing emphasis is being laid on the suitability of the school as a centre about which all neighbourhood activities should revolve.

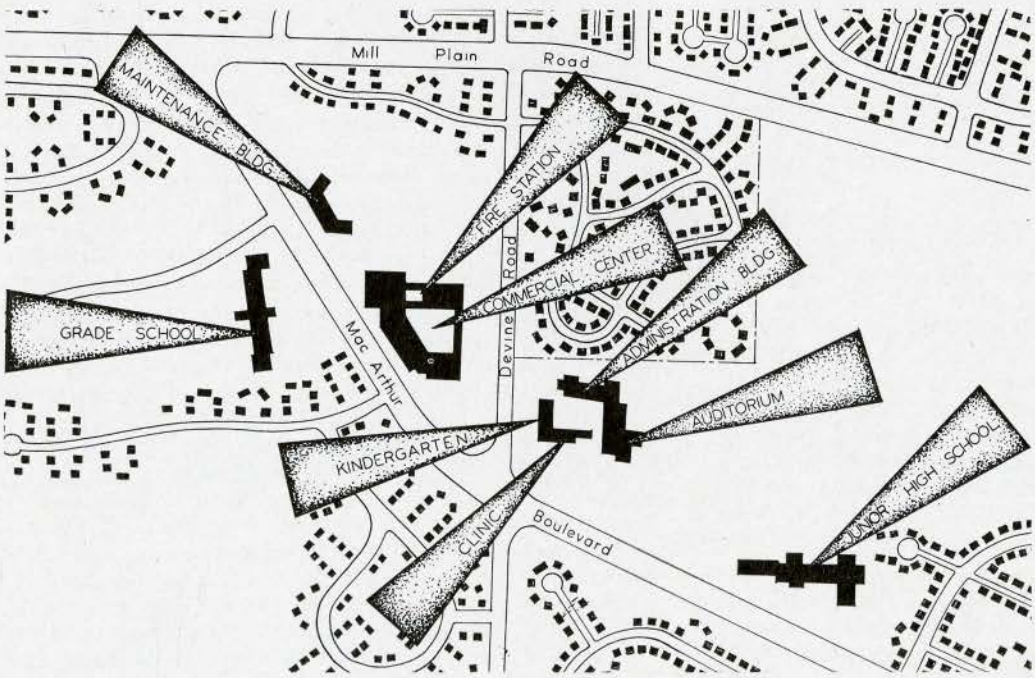
Right, wrong, or partly true, it's not hard to understand how this theory was given birth. Today there is general agreement that the family unit finds itself more and more alone in an urban world of growing impersonal complexity. Lack of a sense of *belonging* brings neglect of democratic responsibilities. Reduced from the status of a human being to a mere statistical cipher, the citizen becomes profoundly discontented with the pattern in which the fabric of his life is woven.

In such an atmosphere, heavily charged with nostalgic yearning for the neighbourly spirit of the small town, city dwellers have sought escape. Suburbs and satellite towns—often little more than dormitory communities—have come into being. The parent city, hard pressed to maintain essential services, is faced with consequent loss of tax revenue—to say nothing of an accretion of blighted areas.

When a completely new community is planned provision is easily made for integration of the life of the individual with that of his environment, but what can be done in the case of existing cities? The solution, almost unanimously agreed upon by planners, pronounces the doom of megalopolis. Briefly, it consists of redivision of the city into organic units of recognizable size. The village incorporated within the city boundaries, the district defined by physical barriers—these are, or can become, neighbourhoods large enough to support facilities like schools and shops yet remain small enough to be negotiable on foot.

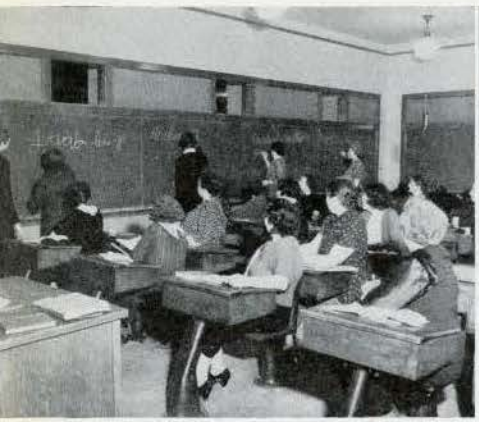
Within the neighbourhood it is natural that the aim should be to discover a lock in which the key of each individual life will turn. Most planning and educational opinion regards the school as the ideal common denominator. It may be a kindergarten, as in Switzerland, or a secondary school, as in England, but designed for multi-vari use it can serve as a medium for participation in self-reliant living.

"The best education," says N. L. Engelhardt, Jr., Director of Air-Age Education, New York, "is the result of a well-conceived neighbourhood plan in which the school has been created



Photos by Vancouver Housing Authority.

War housing project, McLoughlin Heights, Vancouver, Washington, has site plan of unusual merit. Focus of attention is shared by commercial centre and community building. High school is located nearby; elementary schools are scattered throughout residential districts. Statistics include an area of 1,100 acres, 60 miles of streets, 6,100 dwelling units and ultimate population of 25,000 persons.



Fundamental purpose of the school has been and should remain, to instruct. Expression of this function covers adult as well as child education. Appropriate activities are literacy classes, play acting, and cultivation of such hobbies as wood carving, book binding, mechanics and photography.

as an integral part of the daily life of all the people who reside in the community."

The assumption underlying this premise accepts education in a democratic culture as co-extensive with life, beginning in infancy and ending in old age. During childhood and adolescence the educational process is concerned with discovery and facilitation of the inborn capacities of youth, and during maturity with what has been called the "development, guidance and retraining of the adult for individual and social efficiency and enjoyment."

According to Professor Arthur B. Moehlman of the University of Michigan, the community school in a small town should be a central building accommodating the instructional programme from kindergarten onward. In large communities with more specialized buildings the term should be applied to a secondary school, while elementary schools should be considered primarily as parent-education neighbourhood centres. Obviously each structure in its location and plant must bear a proper pre-determined relationship to the other buildings in the school system.

Administrative organization of education is naturally of great importance. The British North America Act, responsible in 1867 for the establishment of the Dominion of Canada, made education a matter of provincial jurisdiction. This decision prevented development of a national school system, but in allowing provincial governments scope for experiment and innovation gave incentive for educational progress.

In Ontario, to take a typical example, there are three basic types of school administered by the Department of Education. These are:

	Grades	*Age of Children*
Kindergarten		5
Elementary	1 - 8	6 - 13
Secondary	9 - 13	14 - 18

The kindergarten is usually combined with the elementary school, of which there are two kinds having a similar curriculum; public schools and Roman Catholic separate schools. Secondary schools are non-sectarian in character and consist of continuation schools, providing higher education in rural districts, high and technical schools, and collegiate institutes. While there are numerous nursery schools (to be distinguished from day-care centres operated by welfare agencies and industrial firms for the offspring of working mothers) catering to the needs of children 3 and 4 years of age, these are under private, not provincial auspices.

It is apparent that adoption of the school-neighbourhood centre principle involves, in Canada, problems peculiar to native conditions. Assuming existence of a dual elementary school system in Ontario and other provinces is a handicap which can be overcome, it is pertinent, while considering the concept of the school as chief leavening force in the community, to consider details of its operation in practice.

Professor Moehlman suggests that the community school could become a meeting place, not only for parent associations of various types but for economic organizations as well, including "professional groups, rural associations, labour organizations, consumer groups, co-operatives and similar agencies whose interests may be immediately narrower than those of the total community."

Going further, John E. Nichols, Supervisor of Connecticut School Buildings and Plans, comments on the use of school buildings as the headquarters for community programmes in such realms as health, welfare and recreation, "Buildings designed for this broader function must encourage by their layouts, and provide the space and equipment for, a variety of community enterprises. For health service there must be clinics and facilities for consultation and community health instruction. There must be space for social work-testing, interviews and conferences in the field of public welfare. There should be office space for the recreation director. In smaller communities particularly the school will accommodate the public library service and will serve as a governmental centre, containing the necessary town offices and space for voting and other governmental functions."

While it may be unseemly, as well as indiscreet, to cross swords with such prominent authorities as these, the question must be asked, "Is requiring the Canadian school to play a part so far beyond its traditional rôle either practical or desirable?"

Ralph Walker, American architect and lecturer at a recent planning course sponsored by the University of Toronto, stated as his conviction that, as the world's population becomes more adult, *the logical focus of any community will be less and less the school and more and more a general centre in which all ages can participate in, not only cultural experience, but healthy recreation.*

A project of this type has been proposed for Troy, New York, a city of 70,000 population, by William Lescaze. The intention is to create a "recreational and social background for pleasant day-by-day contacts and for the making of those lasting friendships which evolve when mutual interests can be enjoyed in appropriate surroundings."

The building, designed to grow with increasing use, has for its site a park conveniently adjacent to a large residential area. While facilities are provided for infants and children, the main appeal of this "citizens' club" is directed to adults. For them there is a gymnasium with rooms underneath for bowling, ping pong, badminton and cards. There is a swimming pool and a roller skating rink—used for ice skating in winter; a theatre, a dance floor and a restaurant. Lounge rooms are

provided and so are rooms for exhibitions and hobbies. Outdoors there are sport facilities for young and old. Parking is provided for baby carriages as well as automobiles!

The advantage of establishing the citizens' club as the centre of the neighbourhood is expressed in the terms used by proponents of the school's adoption for the same purpose. It is claimed that a merging of individual lives with the general life of the community would result; that happiness would be attained through friendly human associations.

While in Canada the school has at least been the scene of some experiment in the way of encouraging public participation in local affairs, the citizens' club—beyond the limited scope of such organizations as the Young Men's Christian Association—has not. The idea is too new, too foreign. If it is to eventually secure popular approval it must first be nurtured to the stage where actual examples enjoy successful existence.

How can this be done? And if neither school nor citizens' club are eligible for the office of neighbourhood centre, what candidate remains?

In early Canadian towns the focal point was invariably the commercial area. The main street—the shops with their muntined windows, the wooden sidewalks, the unhurried passers-by—that was the heart of the community. The dominating feature? Usually the town hall, a structure designed to meet the communal needs of the period: market stalls on the ground floor, council chamber and assembly rooms upstairs. The fire hall and post office, separate buildings, constituted minor elements. Here was a completely satisfying background for democratic living; something precious that was later lost in the chaotic evolution of the city.

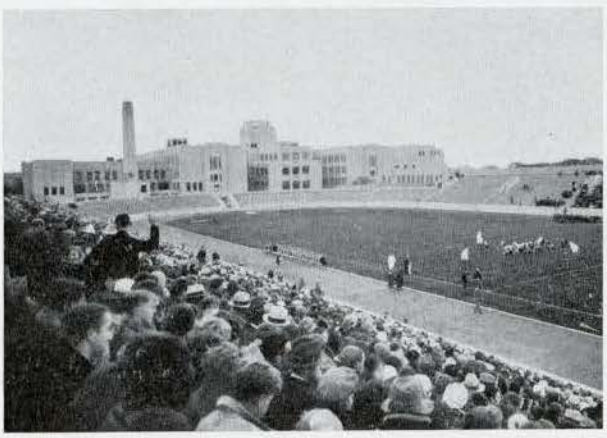
Whether on a community or a neighbourhood plane, the shopping district—together with the requisite buildings of public character — possesses binding force of great power. What it has been, it can become again. In that belief lies hope for new neighbourhoods; salvation for existing ones.

Approval of the commercial-neighbourhood centre principle does not imply that schools or citizens' clubs should not be important factors in the conception of the centre as an entirety. In the Architectural Record of March, 1944, Richard J. Neutra shows by means of a comprehensive, diagrammatic plan how a neighbourhood school and recreation area can be functionally related to a shopping centre.

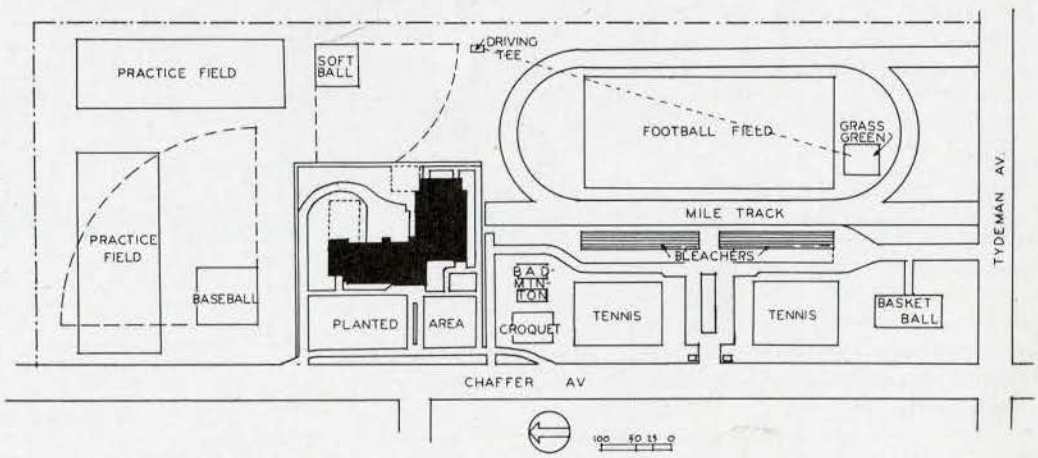
By centring the chief community activities at especially designated points within the city transportation is made speedier and safer. With a community centre serving a large area would be associated a secondary school: with a neighbourhood centre, an elementary school. In either event, schools could continue to be used for such after-hour purposes as adult education and manual training. Their gymnasiums and athletic fields could, if need be, be shared with the whole community: these facilities are expensive to duplicate. All other cultural and recreational requirements would be answered by the citizens' club in the neighbourhood centre. Minimum accommodation might consist of the neighbourhood association office, lounge and meeting rooms, an auditorium (also serving as an exhibition hall or ball room), snack bar, library and creche. The post office, health clinic and municipal offices can be located elsewhere in the centre.

Under such a form of neighbourhood organization, it is certain that the school will be no less a living tool of the community than it is at present. Surely it need have no greater ambition than to adequately fulfil the function for which it was originally conceived. That is, and must remain, instruction.

Photos by Federal Works Agency Nation's Schools, and American School Board Journal.



Athletic equipment and plant represent an impressive investment. Rather than duplicate expenditure it is usually necessary to design high school gymnasiums and stadiums with the needs of the community in mind.



Plan showing how 17-acre site of community high school at Roxana, Illinois, has been developed. Building is well related to drill and practice fields, sports areas as well as garden space. Capacity at present: 350 pupils. William B. Ittner, Inc., St. Louis, were the Architects.

PLANNING AN ELEMENTARY SCHOOL

By **HARLAND STEELE**

For the purpose of this article an elementary school will be assumed to include all grades, from kindergarten, up to, but not including, high school.

The school building in which the typical classroom consists of four walls, a ceiling and a floor, with provision for light and heat, wherein the teacher thinks and plans while the children passively accumulate information, no longer meets the present day requirements of the teaching profession.

The actual school building need not cost as much as did some of the massive, changeless structures of the past. Regardless of what is so often said, children, if they come from good homes and are housed in good schools, do not destroy property, nor are prison walls needed for their detention. They both require and respond to well lighted, well ventilated, tastefully decorated, efficiently planned buildings, situated in attractive grounds. The school must become a miniature of the world in which the student lives, and in it must be the laboratories where continuous planning for the future is carried out.

Most authorities are agreed that the elementary school wherever possible should be planned for one floor only, with easy access to the exterior. Its maximum size should not exceed ten or twelve classrooms, for the elementary school of to-morrow will be a community centre and as such must be upon a plot of ground large enough to provide ample play areas. The Regional Planning Commission of Los Angeles County recommend an area of at least five acres for each school. The increased significance of the School as a centre for the neighbourhood and community life of the grown-ups fully justifies this recommendation.

Basically the school consists of individual classroom units usually about 23 feet in width and 35 feet long. Correct orientation, and the working of these units into an integrated plan, is the major problem confronting the present day architect.

The curriculum of the modern school has advanced far beyond the three R's and ample provision must be made for the teaching of an enriched curriculum that includes painting, music, hobbies and other cultural subjects. Such a programme will require easy access from room to room. In some schools even the children of the Kindergarten will visit another room for an occasional talk. Thus a gradually accelerated, modified rotary system is being introduced even in the lowest grades.

Corridors must be arranged for extreme simplicity. Where rooms open off both sides they should have a clean width of at least 10 feet, use being made of both sides, usually for display cases of student work. In some of the modern European schools the corridor becomes a connecting link between groups of classrooms and as such is used as a covered play area, as in the elementary school in Basel, Switzerland, illustrated in Figure 1.

While of necessity the classrooms will be standardized in size, it does not necessarily follow that they cannot possess individuality. This may be easily attained by using different arrangements of furniture and decorations. Windows, which in the past have been kept to a minimum size for the sake of fuel conservation, becoming much larger with the advent of more scientific methods of double glazing. In much of the recent work it is not unusual to find that the entire outside wall from sill to ceiling is glass.

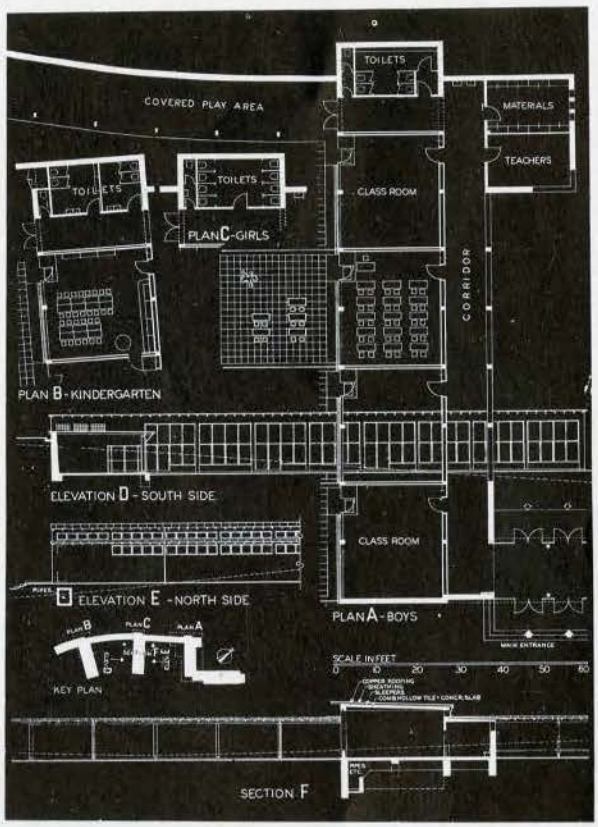


Figure 1.
Primary school and kindergarten detail. Herman Baur, Architect, Basel, Switzerland.

Many educationalists recommend that with each classroom a project room similar to that illustrated in Figure 2 be incorporated. Frequently the lack of a properly trained staff will preclude this, in which case at least one or two special rooms should be set aside as project rooms having special built-in furniture. In many American school plans it is found that each classroom has its own outdoor "classroom" of an equivalent area, but it is

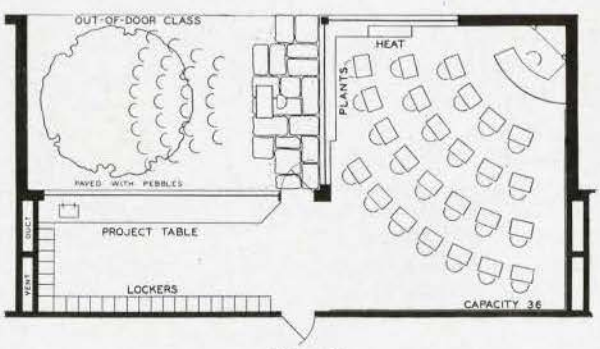


Figure 2.
Showing combined class and project room.

debatable whether in this climate we are justified in incurring a similar expense, when at the most the outdoor "classroom" can be used for only one month or thereabout of the school year.

The use of built-in lockers in each room adds to the economy of building and has the advantage of easy supervision.

Two of the main requirements stressed by elementary school teachers are ample provision for cupboard space and an abundance of cork board for displaying student work. The space over the lockers at the rear of the room can readily be used for the cupboards.

An auditorium, so placed that it can be used by the public without inconvenience to the school, is often a valuable feature of planning. Size will depend upon circumstances, but, it should be large enough to seat at least one-third of the student enrolment, and it should have a well-lighted stage of adequate depth for the presentation of amateur theatricals, participated in by the school and/or the community, together with two dressing rooms. Access to the dressing rooms must be outside of the auditorium.

While it is not an essential part of an elementary school, a gymnasium designed both for school and community use is frequently highly desirable. If one is to be included in the plan, it should be arranged so that it can become a regular part of the daily instruction of the school from the Kindergarten grade up. Gymnasium may also be used for clinics in which examinations and corrective treatment of physical defects can be effectively administered.

An art room, larger than the usual classroom, is another important part of the up-to-date elementary school. It must have a large sink, ample cork board for display purposes, and a large cork board area set at a suitable height to enable children to work on murals, etc. There should, of course, be a specially designed cupboard which will hold student work between classes.

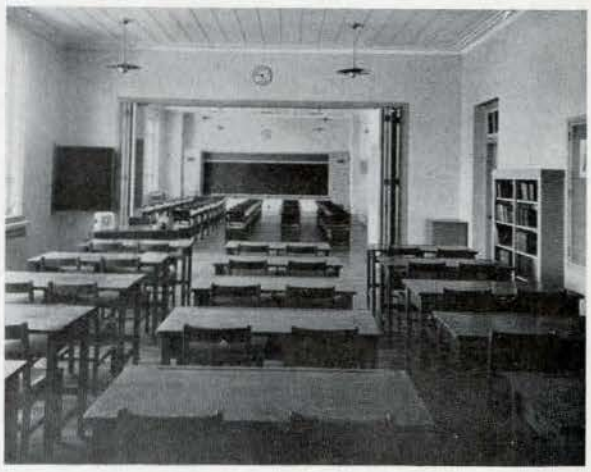
Where possible a natural science room should be incorporated, in conjunction with a small conservatory for the carrying out of experiments. The latter need not be large. Usually a conservatory about 10 feet by 12 feet, with benches around three walls, will suffice. An arrangement should be made in the heating system for keeping this room at a constant temperature both day and night.

The basement need not be dark and unattractive, as it was in older schools. As much attention should be paid to its proper lighting and ventilation as to that of the main portion of the school, for it is here that space is often provided for a supervised students' lunch room, winter play areas, and possibly a lunch room and kitchenette for the teachers.

An often overlooked part of the planning of a school should be the use of colour schemes in the classrooms, auditorium, etc. Nothing is more depressing than the drab so-called "Standard Colours", often used in the older schools. Obviously the colours must be chosen with regard for the orientation of the room under consideration. The classroom is a place in which children must spend a large part of their life. Nothing will lend it a cheerful and inviting aspect more than properly chosen colours, and experience has proven that the more attractive a room is, the more pride the children will take in keeping it that way.

FOREST HILL NORTH PREPARATORY SCHOOL, TORONTO, ONTARIO
PAGE AND STEELE, ARCHITECTS

Corridor in West Preparatory School, Village of Forest Hill, showing the use made of corridor for display cases for student work.



Typical classrooms that can be opened into one large room for meetings, etc. Note public address system loud speaker in each room.

SECONDARY SCHOOLS

By **BURWELL R. COON**

In discussing Secondary Schools at this time we are compelled to give thought to changes that will probably take place in the future in school design, both in planning and materials rather than what has been recently done, because there have been practically no Secondary Schools erected since the first year of the war.

During this period there have been changes in teaching methods and curriculum and there has been developed a demand for practical secondary education which will, of necsity, make some changes in the accommodation and equipment required.

There are still, however, the same fundamental school requirements which are no more important to-day than for many years past, but are more universally recognized as the chief requirements of a school, and that is, the necessity for every scholar and teacher to have a safe, comfortable, heated and ventilated room in which they can see and hear easily. It is the Architect's function to see that the best and yet most economical means of obtaining these results is used.

In order that the students can be safe from the hazards of fire, smoke and panic there must of course be ample isolated exits from the building; corridors and stairways must be wide and bright and unless the building is of fire-resisting construction, suitable fire and smoke stops should be provided.

Heating and ventilating or air conditioning is a problem which has been given a great deal of study by Architects and Mechanical Engineers for many years. Manufacturers of equipment have also done much to develop systems and mechanical devices and these are obtaining results with varying degrees of success, depending in most cases on the intelligence or ability of the caretaker or building superintendent to operate the systems. It is important in designing or selecting a system that the size and location of the school and the probable ability of the caretaker, and the proximity of expert service for the mechanical equipment be considered, as it is quite impractical to have complicated mechanical controls and devices installed in an isolated community where the plant may become inoperative for lack of service. The final result must be that the rooms are provided with plenty of fresh air of a suitable even temperature and humidity, without noise or objectionable circulation.

Natural or window lighting is important, and authorities still appear to agree that this lighting should come from the left of the student and preferably from the rear high left rather than from the front left, but this ideal condition cannot be obtained for all scholars in a room. Windows close to the left front are very objectionable to the students in the right front and in cases where the rear wall of the classroom is an outside wall and windows could be installed in the rear wall, these would be objectionable for the teacher. In top floor classrooms or one storey buildings, roof lighting as an auxiliary to the side wall window lighting is good but skylights are notoriously difficult to maintain and are objectionable because of loss of heat in cold weather, overheating in warm weather, and are almost useless in the case of heavy snowstorms. In one storey or top floor rooms auxiliary window lighting from the left side and from above the ceiling of the corridor has been introduced very successfully.

All the natural lighting obtainable through any of the above mentioned methods is not sufficient to take care of dull weather, and electric lighting if properly designed, is more satisfactory and more continuously even in intensity, for all locations in the rooms. Artificial blackboard lighting should be used regardless of the amount of natural lighting available in order that all parts of the blackboard are equally lighted and that there is no glare or objectionable reflection. This lighting should be so arranged that the actual filament or source of light is shaded from the view of the students and should be high enough and close enough to the board so that the teacher when standing at the board facing the class, is not affected by the glare. Regardless of the excellence of the lighting whether natural or artificial, the classrooms should not be overly large or the students at the rear or farthest away from the blackboard will be handicapped.

Where expense is not too great a consideration, the general classroom lighting, using equipment at present available, is best obtained by a sufficient number of either indirect lighting fixtures or by a fixture which combines both direct and indirect lighting and there are several fixtures of this description available. To obtain a high intensity of light both on blackboard and on the students' desks is not sufficient in itself. It is necessary to obtain this high intensity evenly distributed and without objectionable glare or reflection from the surface of the desk or the paper, and the source of light should be pleasing or not noticeable.

Classrooms should be treated with acoustic material so that the rooms will be quiet within themselves and should also be isolated with as soundproof partitions, floor and ceiling as possible, to shut out the sounds from the corridors and other parts of the building. In planning, an effort should be made to isolate the gymnasium, the music room, the shop, the commercial and home economics rooms so that all rooms where practical work is in progress will be somewhat segregated from rooms where quiet studying and teaching is being done.

There is a trend to equip the classrooms with more bulletin boards and less blackboards. Seats and desks of the moveable type are being used and ample cupboard space should be provided, and these cupboards should be designed to suit the class of work being taught in the various rooms. This is particularly true of art, geography, history and commercial rooms. These, as well as the home economics departments and the

shops must be studied for size, equipment and location in the building in accordance with the requirements of the local conditions.

Wherever possible the structural design and plan should be such that without structural changes partitions can be moved to accommodate changes that might take place in the future in the requirements for various subjects.

In large schools every room should be equipped with a loud speaker which can be used for radio programmes and public address. It can also be used as a communicating system between the administration and the clossrooms.

Every room should be equipped with electric plug outlets so that moving pictures or lantern slides can be used as this method of teaching develops.

As a matter of economy it is sometimes necessary to combine the auditorium and gymnasium in one room, and in small schools there is no serious objection to this arrangement. It is certainly not economically sound to have large expensive portions of buildings used only for a short time during the school day. In large schools it is more satisfactory to have separate spaces provided for gymnasium and assembly. It is even more satisfactory in large schools to have a gymnasium for the boys, one for the girls and a separate auditorium, in which case the auditorium can be properly designed with a sloping floor, fixed seats and a good stage for amateur theatricals produced either by the students or by community effort. It is then possible for all three of these rooms to be in use practically all of the time, if the school time-table is properly arranged so that physical training for both boys and girls can proceed at the same time, and the auditorium, when not in use for assembly purposes, can be used as a study room or for classes in subjects where a room of this kind is suitable.

The time has surely come when the gymnasium as well as any other part of a school need not be buried below the ground in the basement. Only restrictions as to size of site can be an excuse for this type of building. The gymnasium should be as bright as possible with natural daylight on both sides where conditions will permit, and no light at either end. It should have a high ceiling in proportion to its length and width and provision should be made for spectators. There should be ample storage room for the gymnasium apparatus when not in use, and where the size of the school permits, a small office for the instructor with private dressing room and shower should be planned as well as ample dressing rooms and showers for the students.

Where the gymnasium is used as an auditorium or assembly room a suitable platform or stage and storage facilities for moveable seats should be provided. In this double purpose room it is necessary to provide protecting screens on the interior of the windows, and curtains or window shades so that the room can be darkened for moving pictures. There is also the problem of providing indestructible wall and ceiling surfaces and yet obtaining suitable acoustic treatment for assembly purposes.

The stage in many schools has been neglected to such an extent that in most cases it is not suitable for even amateur theatricals. If possible, the stage should be reasonably proportioned and provided with enough equipment such as proscenium, wings, back drop, border lights, electric receptacles and electric switchboard, so that if there is a member of the school staff who takes sufficient interest in the use of the stage, he will be able with the help of the students to add the required equipment for their productions. It is a mistake to provide too much equipment, some of which may never be used unless there is trained personnel on the staff.

A shooting gallery has become a desirable feature and should be located where there is no possibility of traffic interfering with the shooting and such space should not be used for any other purpose. A good location can usually be found below the ground floor corridor with the ceiling not more than four or five feet high with a shooting pit at one end and a marker's pit at the other.

In most Secondary Schools it is necessary to provide lunch rooms and some cafeteria equipment. This accommodation should not be installed in a dark basement. The cafeteria itself might be reasonably close to the gymnasium for the use of evening community activities if there is a demand for such service. The lunch rooms should be such that they can be used for other purposes than lunches, such as waiting rooms or study rooms; otherwise, they become expensive areas which are used for only an hour per day.

Wash rooms for students are no longer treated as large waiting rooms or play rooms located in a dark or inaccessible basement but can be small rooms with plenty of outside light and opening directly off the main corridors and reasonably screened by means of a dwarf partition inside the entrance.

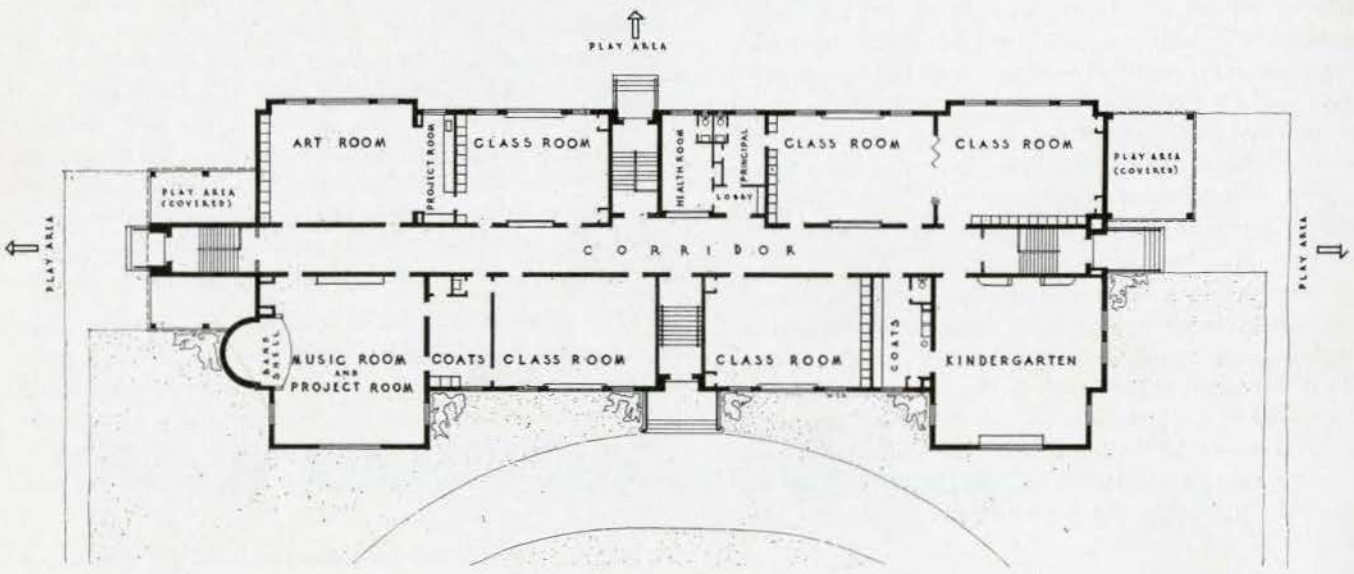
It is a popular idea that after the war when materials of all kinds will be released for construction purposes and when the great industries developed during the war are turned to peacetime activity, that new materials and new uses of old materials will revolutionize construction. During the past four or five years construction and design have been hampered by the dictates of the materials available. If our fond hopes are realized we will be able to build walls of brick, tile, concrete, glass blocks, fibreboard, prefabricated insulated metal panels, plastic panels and probably many other materials or methods not yet thought of. We have been using wood joist construction and concrete and steel, and there may be new methods of using these materials and new materials which will be better and probably more economical. Floors have been finished with wood, linoleum, asphalt tile, marble, quarry tile and terrazzo, and we are led to believe that other finishes with better qualities and probably less expensive will be placed on the market.

We may be able to use some other type of window than metal or wood and double glazing may develop to a point where it can be used commercially. Door frames may be of metal, wood or plastic; metal and marble toilet partitions may be replaced in plastic or other compositions; new finishes for wall surfaces may replace the plaster which has been so long the recognized medium.

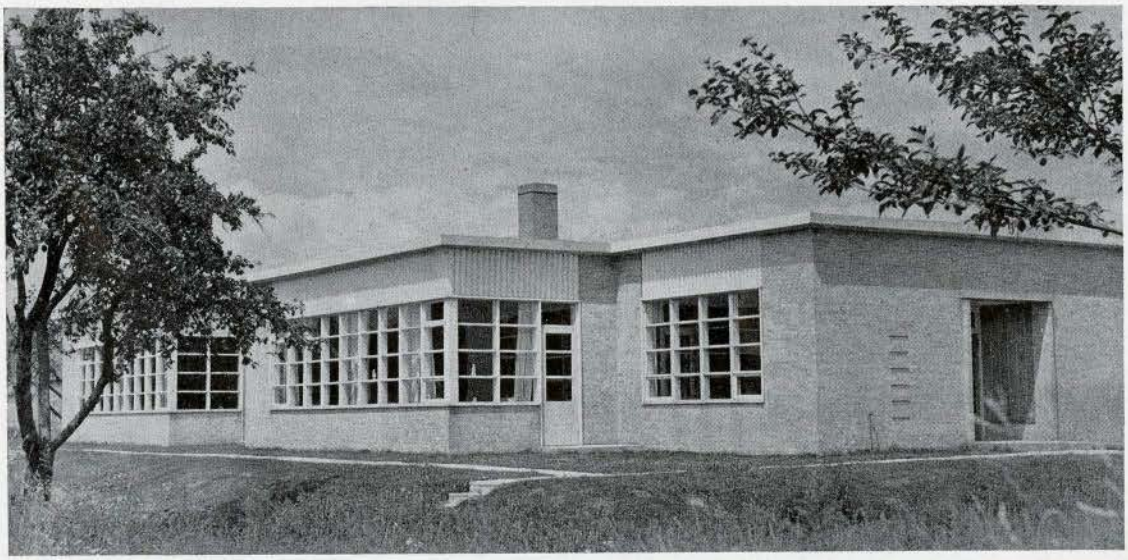
With the changes that have come about in the methods of teaching and the subjects that will be taught and with the new materials and equipment that will no doubt be available we can look forward to a very interesting period for Architects during the next few years.

WEST PREPARATORY SCHOOL, FOREST HILL VILLAGE, TORONTO, ONTARIO

PAGE AND STEELE, ARCHITECTS



FLOOR PLAN



SUNNYLEA SCHOOL, TORONTO, ONTARIO

JOHN B. PARKIN, ARCHITECT

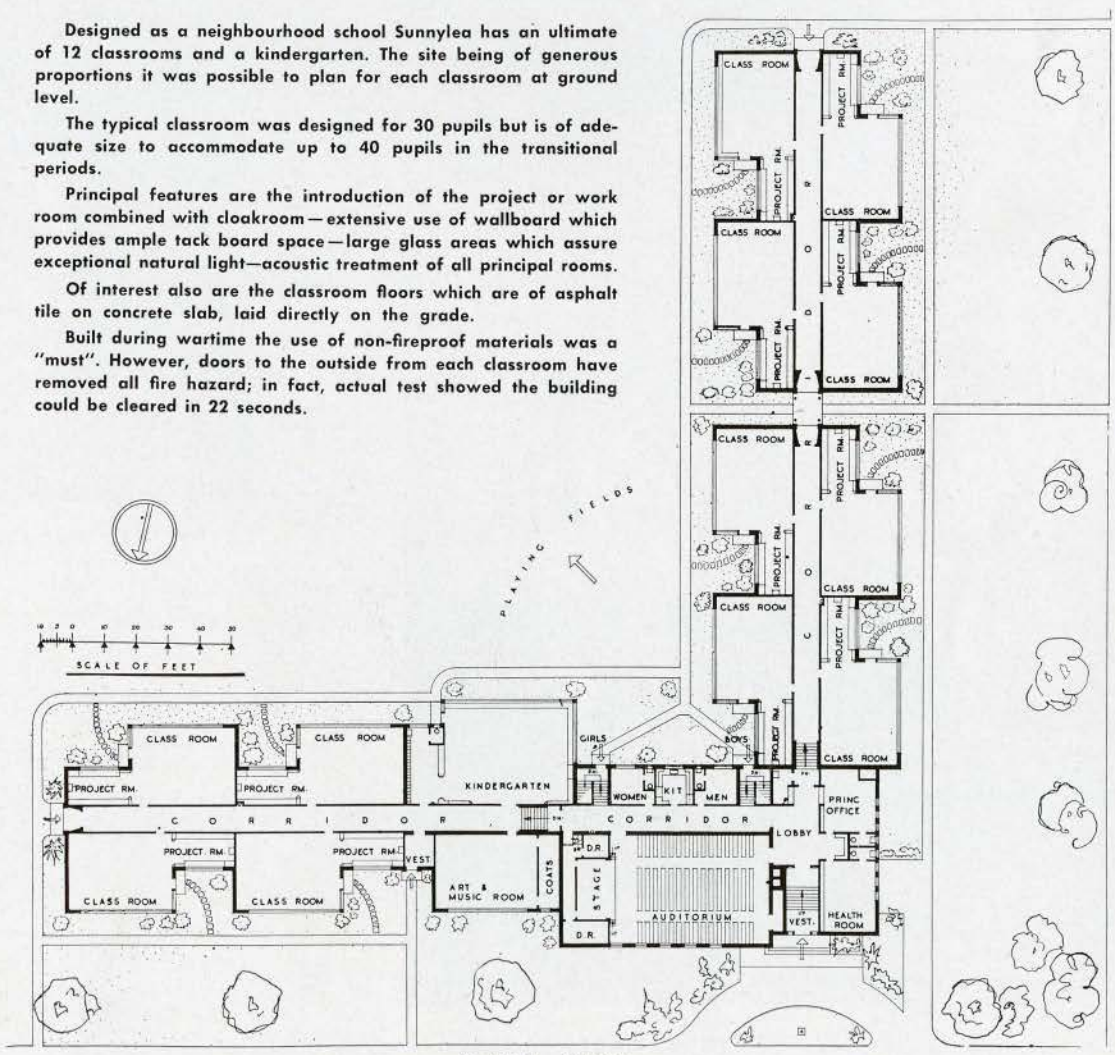
Designed as a neighbourhood school Sunnylea has an ultimate of 12 classrooms and a kindergarten. The site being of generous proportions it was possible to plan for each classroom at ground level.

The typical classroom was designed for 30 pupils but is of adequate size to accommodate up to 40 pupils in the transitional periods.

Principal features are the introduction of the project or work room combined with cloakroom—extensive use of wallboard which provides ample tack board space—large glass areas which assure exceptional natural light—acoustic treatment of all principal rooms.

Of interest also are the classroom floors which are of asphalt tile on concrete slab, laid directly on the grade.

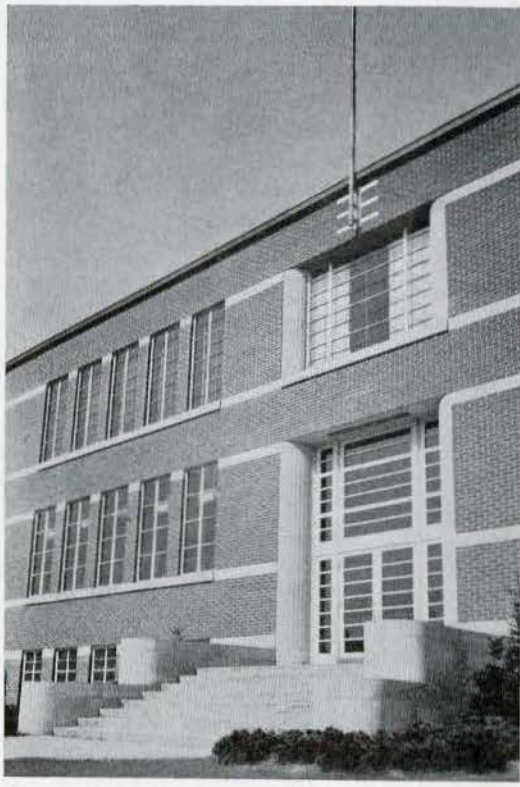
Built during wartime the use of non-fireproof materials was a "must". However, doors to the outside from each classroom have removed all fire hazard; in fact, actual test showed the building could be cleared in 22 seconds.



FLOOR PLAN

ROLPH ROAD PUBLIC SCHOOL,
LEASIDE, TORONTO, ONTARIO
S. B. COON AND SON, ARCHITECTS

KINDERGARTEN



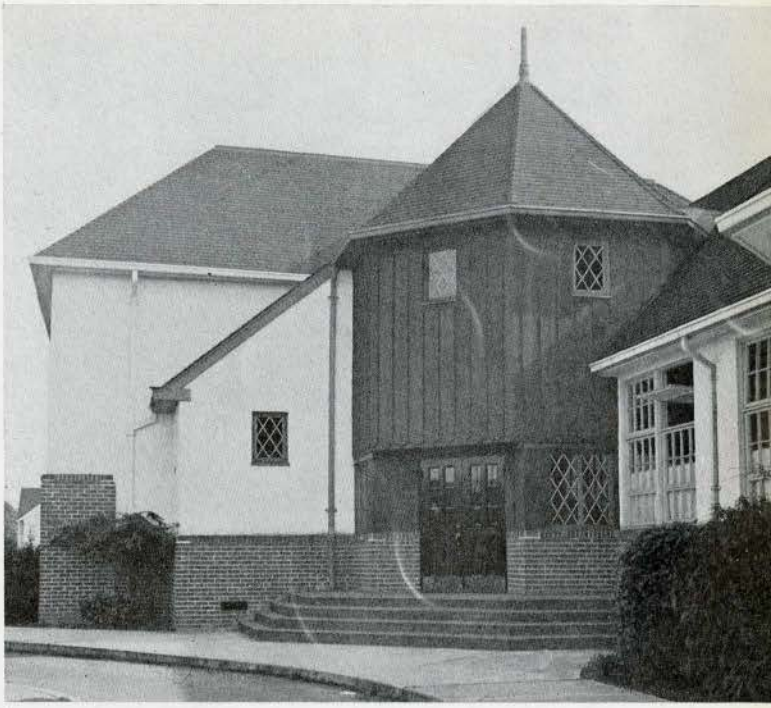
ENTRANCE DETAIL

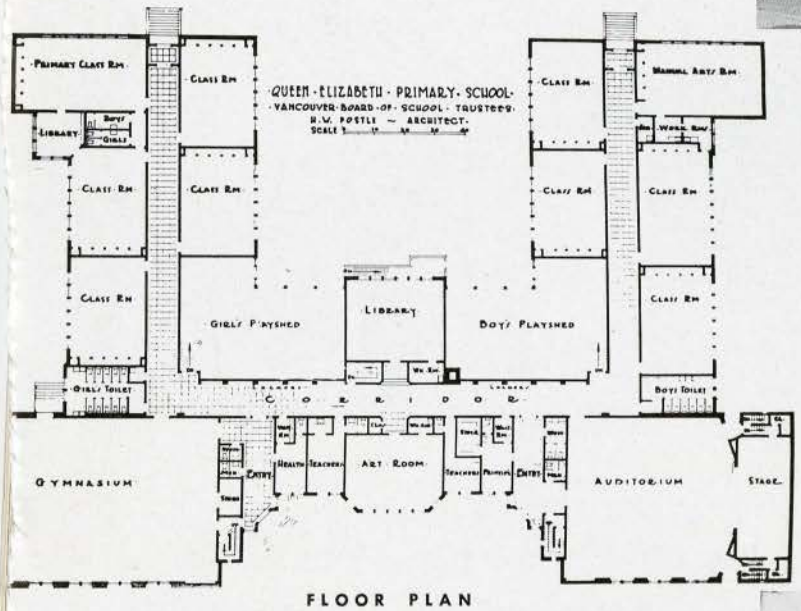
KINDERGARTEN MURALS

QUEEN ELIZABETH PRIMARY SCHOOL,

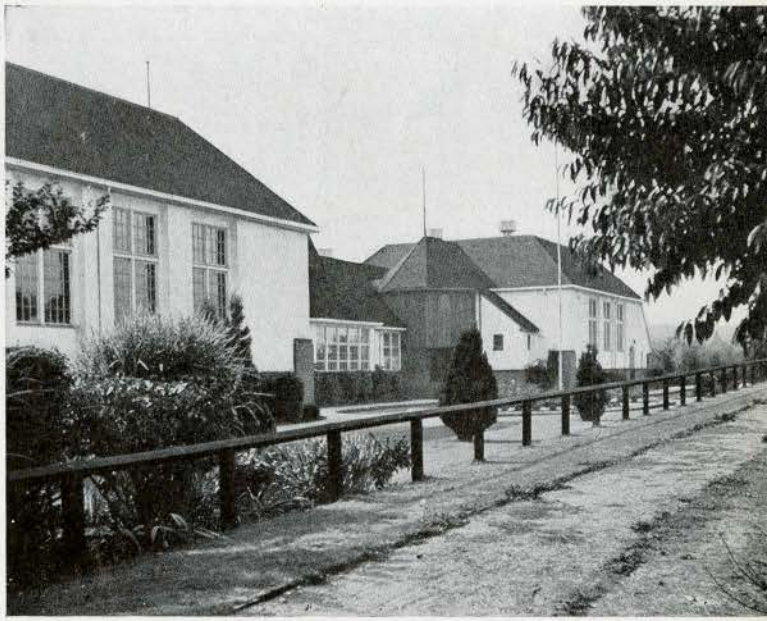
VANCOUVER, B.C.

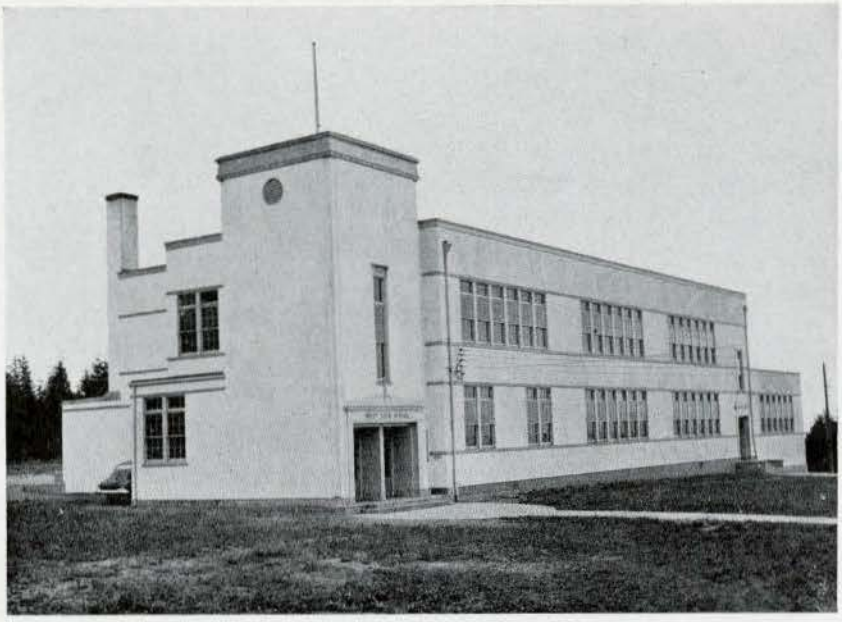
H. W. POSTLE, ARCHITECT





FLOOR PLAN

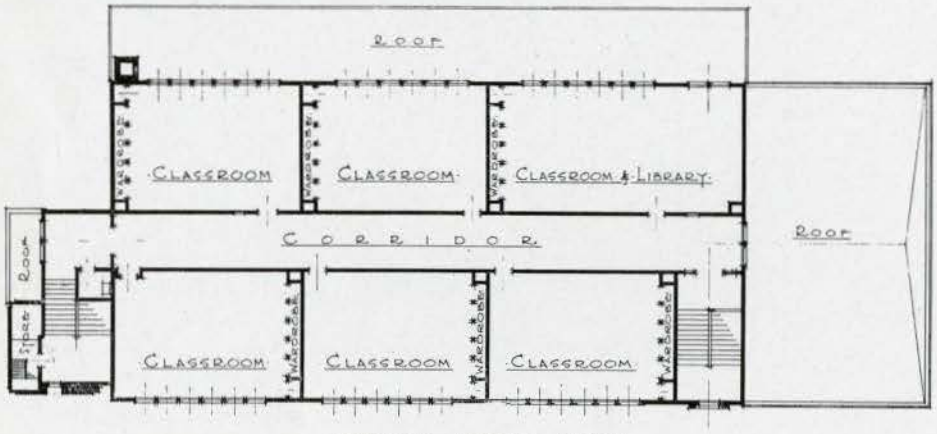




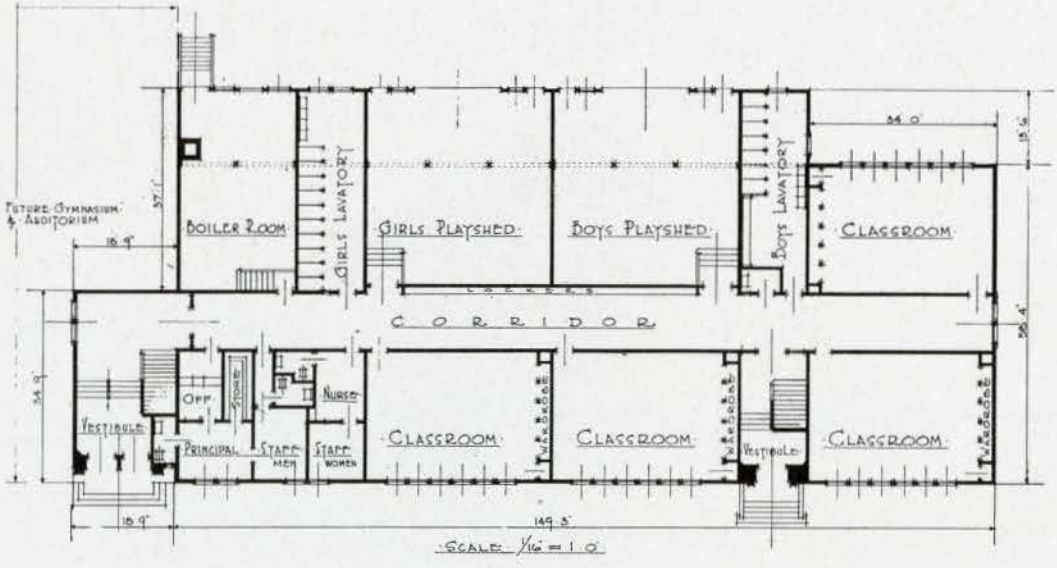
WESTVIEW SCHOOL,

NORTH VANCOUVER, B.C.

McCARTER AND NAIRNE, ARCHITECTS



SECOND FLOOR PLAN



FIRST FLOOR PLAN

SOME ASPECTS OF HEATING AND VENTILATING SCHOOL BUILDINGS

By KAREL R. RYBKA

The last years before the War have been filled with intense activity in the field of school design. This brought about very comprehensive studies of comfort heating and ventilation for the school of the present and that of the future. The fundamental concepts which developed therefrom disclosed, however, such far-reaching differences that no final and generally acceptable solutions of the problems could be evolved.

This uncertainty is due to the varied approach of the individual investigators to the problems of comfort, which invariably was influenced by their personal interest in or connection with: (a) the developments of engineering science and research, (b) the varied, often contradictory advances in medical research, (c) the local or regional climate, (d) the physical condition and the socio-economic status of the subjects under investigation, and (e) personal, local or regional prejudices.

In addition, it has been disclosed by such extensive and all-including studies as those of the New York State Commission on Ventilation, that even an unbiased observer can read any desired answer into a set of questions from observations made in the field, provided that certain basic factors are minimized or entirely neglected; on the other hand, a simplification of the premises of any major field study is necessary, as the consideration of all climatic, physiologic, socio-economic and engineering details in each case would lead to a maze of answers which would more becloud than clarify the issue.

Out of these difficulties arose the inevitable facts that in the late thirties one authority would condemn mechanical ventilation for school buildings, another would consider it a necessity and would not stop short of anything but complete all-year-round air conditioning, the third would insist on solar type schools, and the fourth go to the extreme of open-air education. Each of these general tendencies was well-backed by extensive and careful research and supported by well-known educators and medical authorities.

As an example may serve the school system of Montreal. The Protestant Schools were, for several decades, consistently equipped with complete systems of automatically controlled supply and exhaust ventilation, in addition to direct heating systems, which in the majority of cases were provided with individual, automatic room temperature control; on the other hand, the Catholic School Board insisted on window ventilation—preferably designed as cross ventilation—and the usual direct heating systems were centrally controlled or at the best zoned.

It is, therefore, difficult to formulate even the general requirements for the heating and ventilating of a modern primary or secondary school, particularly as it embraces a wide variety of buildings from the unobtrusive one or two classroom little red schoolhouse to the ultra-modern collegiate institute with all its adjuncts and appurtenances.

These problems are, of course, substantially simplified by the fact that the schools are in operation usually only for ten months of the year. In our climate, of this period about seven months require heating, and for economy, only minimum ventilation. This concept is unlikely to change in the near future and it automatically reduces the necessity of concerning oneself to any extent with the periods of excessive summer heat. As a matter of fact, only on very few days during the school period is the summer heat really objectionable, and as this happens to be the end of the year, with the major part of the work concluded, no harm is done by relaxing the strict routine on such days.

Minimum Ventilation Requirements

The vitiation of classroom air by carbon dioxide from the breath of occupants is negligible, as compared with body odours. Ventilation requirements of schools may, therefore, safely be restricted to air quantities sufficient to cope with the latter. In schools having an air space per pupil of about 300 cu. ft., an outdoor air supply per pupil from 15 cu. ft. per minute for children of average income families, to 22 cu. ft. per minute for children of poor families, is considered at present sufficient for this purpose. This is equivalent to about 3 to 4½ air changes per hour, and normally cannot be fully supplied by natural air change due to in-leakage through window cracks, etc., although due to the large window areas of classrooms, an average of two air changes per hour may result from normal air infiltration in the winter.

The normal in-leakage can be raised by means of a strong air exhaust from the building, usually taken from corridors or locker-rooms, but this has the tendency to cause uncontrolled, sometimes excessive in-leakage at some points and to unbalance the air movement through the building. It is, therefore, preferable to provide at least a limited continuous air supply, or to rely on a rapid air change during the intermission in classes, and little argument can be advanced against the view that this form of ventilation is sufficient; in the worst case one or the other window can be slightly kept open during classes and should then suffice to keep the air in the room quite satisfactory. The most serious drawback to window-type ventilation is its dependence on the human element and on the idiosyncrasies and whims of individuals.

Mechanical ventilation remains, therefore, of importance wherever it is desired to ensure a continuously and automati-

cally regulated renewal of air and to remove dust or dirt from the air before it is supplied to the classroom. (This last consideration is of secondary importance as considerable dust is brought into the buildings by the pupils anyway, and a high degree of cleanliness is essential in all schools, regardless of the type of ventilation system used, or the district in which the school is situated). It is, of course, understood that copious mechanical ventilation may be required for auditoria or assembly halls, and in such cases the extent of ventilation requirements should be in accordance with general practice for lecture halls.

If mechanical ventilation with positive air delivery is employed in classrooms, it is essential to provide the full forementioned air supply—unless more air is exhausted than is being supplied—as the positive air supply reduces and even stops natural air infiltration into the room.

One of the questions which has received considerable publicity in the past was the bugbear of proper humidity of the air. This has gradually lost its importance and to-day little weight is attached to it in school work. If we consider that some of the famous mountain resorts for treatment of respiratory illnesses have average winter air humidities of less than 10%, it needs little explanation why recent research on the influence of low and variable humidities on human comfort has shown negative results.

Furthermore, the average winter temperature in the more populated parts of Canada is from 25 to 35 deg. F., which with the high relative humidities prevalent in the winter out-of-doors would ensure from 10 to 20% average relative humidity after the air is heated to room temperature. The moisture given off by the pupils will raise it in classrooms by about 10%, even if the full recommended quantity of air is being supplied. The relative humidity of room air is usually being limited to less than 30% in the winter to avoid condensation and frosting of windows and little would thus be gained by special treatment of air to ensure this slight improvement.

Heating Requirements

It would seem that proper heating of a classroom should be a reasonably simple matter as it would only entail maintaining an optimum temperature provided that the desired purity of air is maintained by independent means. Upon closer study, however, it will be found that there is no final and reliable information on the optimum temperature and that it is still a matter of extremely diversified conjecture and of heated argument.

The New York State Commission on Ventilation recommended for grade schools temperatures between 66 and 68 deg. F., at moderate air humidities and air movement; this is in agreement with British and other research, but the general practice has consistently been calling for, and usually maintaining, temperatures exceeding 70 deg. F. Either of these values is in disagreement with the diverse data on effective temperatures, feeling of comfort, etc., which have been published from time to time by the American Society of Heating and Ventilating Engineers and other authorities.

These contradictions are partly due to the complicated mechanism of heat transfer. It consists of three components, radiation, conduction and convection. In buildings, the already mentioned infiltration of air through cracks and crevises, and conversely exfiltration at other points and the capacity of building walls and floors to store heat and give it off when the temperatures of the surroundings drop, must be considered as fourth and fifth components of heat transfer. They will participate in each individual case in a different ratio in the movement of heat from a warmer to a colder body.

Convection (together with infiltration) is responsible for any air circulation in spaces which are not subjected to mechanical circulation. Unless proper means are taken to correct it, the air movement will be downward on outside walls and windows, and will travel along the floor to low points of the building. This will cause very noticeable cold drafts along the floors. Heat supply from interior walls towards the outside, which is occasionally employed even in new schools for the sake of low first cost, tends to accelerate these drafts. The old adage for school heating that the foremost need is to "keep their feet warm and their heads cool" still is one of the best criteria of a satisfactory heating system, and cannot be fulfilled when cold floor drafts are in evidence.

The mechanism of heat transfer from and within the building is, however, of lesser influence than the fact that the human body does not merely react to temperature conditions but rather controls its own continuous discharge of heat (metabolism) to the surroundings in relation to the extraneous temperature conditions. This control does not follow a uniform physical law but on the contrary is extremely complicated and has been clarified only to a very limited extent.

The basic research on the American Effective Temperature Scales and Comfort Charts was made before 1932. This research considered primarily the influence of the air surrounding the human body. British, French and other investigators proved, however, that a great influence must be attributed to the temperature of the surrounding walls, which in turn depends on outdoor temperatures, sunlight, wind, etc. Subsequent American research has confirmed it, and corrective coefficients have been introduced for some typical conditions.

It has also been proven that the threshold of feeling radiant heat varies quite considerably. The human skin will notice as small amounts of radiation from dark bodies as .04 calories per square centimetre per minute but with radiation from luminous sources this threshold rises to .7 calories per square centimetre per minute, and British investigators have also found that prevalence of long-wave infra-red radiation from dark surfaces is apt to cause a feeling of stuffiness regardless of the actual quality of the air. This explains to some extent why even strong solar radiation seems often less objectionable than that from heating surfaces placed or from solar heat absorbed within the room, and it ties the heating problems to lighting, orientation of buildings or the size and placing of windows, and other design features.

These and other considerations have been studied in America and abroad and the basic comfort tables, although still in use, have been supplemented with so many amendments, restrictions and explanations that they may be used safely only in

very special cases. No satisfactory method has, however, been devised to apply these different principles in a definite and uncompromising manner to the design of heating systems.

This difficulty is being further enhanced by infiltration of design trends from the southern parts of America, from Britain, France, and other countries. Some considerations which have been instrumental in developments abroad cannot apply here, others require considerable modification, which can be made only after further careful local or regional investigations. All such importations must be considered as experiments.

Summary of Present Practice

The hot air heating system is still occasionally in use in small schools, due to its inherent simplicity and safety in operation, and also because local labour can usually be employed for its installation. In larger schools, hot water heating or steam heating systems with direct heating surfaces in the classrooms are in general use. It is customary to place the heating surfaces under the windows to counteract down-drafts.

There are innumerable forms of temperature control systems for these heating systems. The individual room control although the most expensive, is still widely in use and is justified by the independence of the heat regulation from the human element. Centralized control with manual operation of radiator valves in the classrooms is most widely used, although zone control has penetrated successfully into large multi-storey buildings in which classrooms vary in exposure.

Some complications arise if a mechanical supply ventilating system is introduced. Many schools have lately been equipped with small supply ventilating and air heating systems in the individual classroom — in addition to hand controlled radiators. They consist of a heating unit through which outside air is drawn, heated and discharged into the room; exhaust stacks or central exhaust ventilating systems are then used to remove the excess of air from the building. It is customary to control the room temperature by controlling the heat delivered by the air supply unit. To eliminate cold drafts, a minimum temperature of the discharged air must be maintained, which sometimes causes overheating. On the other hand, on very cold days in sunny rooms, freezing of the heating units could occur, unless it is overcome by additional controls to permit reduction of outdoor air supply and partial recirculation of room air through the ventilating unit; besides complicating the installation, this feature will defeat to some extent its main purpose of definite outside air supply. To overcome this drawback, "non-freezing" heating elements have been developed and successfully used in some of the recent schools.

For large schools, central ventilating systems of diverse forms have been developed. In general, they will supply at all times a minimum of fresh air and if necessary mix it with air returned from the building, heat and humidify it and deliver the proper proportion to each classroom. Attempts to eliminate in such plants the direct heating surfaces under windows or other cold surfaces, present serious hazards to the comfort and even the health of the pupils.

Considerable publicity has also been given to diverse, recently developed types of school buildings including single storey units with unconventional means of heating and ventilation. Regardless of the background of these designs, they must not be applied without careful consideration of the local climate. More attention must be given to the insulation of roofs, walls and particularly windows and floors in our climate than in the maritime climates where some of them originated.

Even if heating surfaces are installed in walls or ceilings, as proposed by adherents of the much discussed panel heating, they cannot always overcome cold radiation of all the outside surfaces and cold conduction and convection from the unheated floors—particularly in sub-zero weather. Although laboratory investigations have disclosed satisfactory floor temperatures due to absorption of the heat from above, in certain types of rooms which were equipped with ceiling radiation, it must be considered that in class-rooms much of the floor is shielded from the overhead heating surfaces by furnishings and by human bodies and that the cold glass surfaces are usually very large. Neglect of these considerations in classrooms will inevitably lead to undesirable conditions, which are difficult to correct. The satisfactory results obtained with these heating systems in "open-air" schools in Britain may be partly due to the fewer pieces of furniture used and greater freedom of movement of the pupils usually allowed in this type of school.

When comparing the panel heating with the conventional types of heating, the high first cost of the former must be considered. Although some of the American panel heating designs were based on maximum water flow temperatures of 125 deg. F., it has been fairly conclusively established that, to ensure comfort and economy under all conditions, the maximum design temperatures of panel heating should not exceed 110 deg. F. This necessitates very large heating surfaces if sub-zero temperatures have to be met, and proportionately increases the cost of the plant.

Prominent exponents of panel heating have repeatedly cautioned designers against all attempts to meet the competition of the conventional methods of heating on the basis of first cost. Such competition is only feasible by reducing the heating surfaces, which invariably is detrimental to the performance of the installation.

Panel heating installations have shown a marked fuel economy in countries with mild winters; as the savings due to reduced average room temperature decrease with lower average out-doors temperatures, it is inevitable that the economy of these plants will be lower in cold climates, but only actual operating records will disclose whether the lowered savings will still justify the higher first costs.

SCHOOL LIGHTING

By J. W. BATEMAN

Advances in school lighting practices necessitates greater care in the design of a school's lighting system if the latest and best results are to be obtained. Not only must the system of lighting, direct, semi-direct, indirect or semi-indirect, be decided upon, but also the type of light source, incandescent, fluorescent, or combinations be selected.

Fluorescent or Incandescent

In both the designing of lighting for a new school building and in the relighting of an old one, the first question currently considered is "Should fluorescent or incandescent be used?" This is a question which cannot always be answered by a simple "yes" or "no". There are many factors which influence the decision, as first cost, power rates, wiring, foot-candles required, type of room, quality of lighting needed.

Some characteristics of standard fluorescent lighting are as follows:

1. High efficiency—from two to three times as much light from the lamps for the same total wattage.
2. Low brightness sources—of importance where lamps are exposed to the eye or the work.
3. Light mixes well with daylight.
4. Long lamp life.
5. Higher first cost.
6. Newest form of lighting.

Incandescent lighting has the following considerations:

1. It is simple to use.
2. Lamps are higher in wattage—fewer required.
3. Well adapted to indirect and semi-indirect lighting.

A School an Institution

The lighting of a modern school building comprises more than classroom lighting, although this is most important. There are many other lighting problems in the sewing room, the art room, the gymnasium, manual training rooms, auditoriums, libraries, laboratories, offices, corridors, locker rooms and toilets. The modern school is an institution of considerable proportions and the lighting needs are varied. The lighting suitable for one location may be entirely wrong for another.

The lighting for the manual training rooms or shops may follow good practice in similar work areas in industrial and commercial fields. A machine shop should be lighted by the same type of equipment, and to the same standard as recommended for a regular machine shop.

Office lighting should conform to good office lighting practice.

Library lighting should be very comfortable and ample in quantity to permit reading a variety of books and printing without eyestrain. This lighting is often neglected with the result that seeing conditions are very poor, and full use cannot be made of this room.

Classroom Lighting

The effects of classroom lighting upon the educational progress and visual welfare of school children is well known but often not heeded. Researches in seeing have consistently shown that more light and better lighting have contributed to the achievements of pupils and to their physical well being.

A Cambridge, Massachusetts, lighting-scholarship study as reported in the Illuminating Engineering Society Transactions, Vol. XXXI, No. 8, showed the following results of better lighting:

The gain in the educational age of the pupils in the better lighted room was ten per cent.

The gain in reading age of the pupils was twenty-eight per cent.

The pupils in the better lighted room showed a lesser gain in mental age. While the pupils in the poorly lighted room were gaining more in mental ability, the pupils in the better lighted room were gaining more in knowledge. This makes any gain in knowledge due to lighting more significant.

Foot-Candles of Illumination

The amount of illumination required depends on a number of factors. Considerable study has been given to this phase of school lighting, and a bulletin covering recommended practice of school lighting was prepared under the joint sponsorship of the Illuminating Engineering Society, and the American Institute of Architects in 1938. Further progress has been made in the past six years.

The Ontario Department of Education in regulations for Public and Separate Schools and for High Schools and Collegiate Institutes gives minimum values of illumination for various school rooms.

	*Foot-candles**	
	Ont. Dept. of Educ. Minimum	*Recommended Modern Practice*
Classrooms, Study Halls, Libraries	15	30
Drafting Rooms, Art Rooms	25	50
Gymnasium	15	20
Shops, Laboratories	15	30
Sight Saving Classes	30	50
Auditoriums	6	10
Corridors, Stairs	4	5

*These are the foot-candles which should prevail after allowance has been made for depreciation of lamps and dust accumulation between cleaning periods. Initial values will be about 50 per cent. higher.

Economic Analysis

The economic analysis will of course vary depending upon actual conditions. Variable are, the foot-candles required, the type of luminaire selected, the cost of the lighting equipment, the method of amortization, power cost, room conditions, and operating hours per year.

For the comparison here, an indirect incandescent system to give about 25 foot-candles has been selected. A fluorescent system to give higher foot-candles has been chosen because with the semi-direct form of lighting suggested, more light is needed to minimize contrasts in brightness and to make the lighting comfortable particularly from reflected glare from desk tops and paper. If indirect fluorescent lighting were considered (which has not as yet come into general practice), the same foot-candle values could have been used, but there would not be an equivalent reduction in the number of fluorescent lamps required. There is, however, the added consideration that fluorescent lighting is more like daylight in character, and therefore, psychologically, higher amounts of illumination seem desirable.

In designing for the foot-candles specified in the analysis cognizance is taken of the fact that, for the most part, the artificial lighting is used along with a certain amount of daylight. However, while relatively high values of daylight may be received along the windows, often the light on the inside row of desks is less than five foot-candles. On this account, with all systems of lighting, arrangements should be made for switching separately the inside and outside rows.

Typical Economic Analysis

(Room Size—23′ x 30′ with 12′—3″ ceiling.)	*Incandescent*	*Fluorescent*
Total Area Square Feet	690	690
Type of Luminaire	Indirect	Semi-direct
Number of Units	6	20— 5 continuous rows 40—40 w. lamps
Lamp wattage per unit	750	2—40
Rated lamp life (hours)	1000	2500
Foot-candles provided	25	42.5
Total wattage	4500	1910
Luminaire cost (estimated)	$25.00	$40.00
Total	$150.00	$800.00
Lamp cost each	$5.55	$1.30
Total	$33.30	$52.00
Total first cost	$183.30	$852.00
Annual Amortization cost*	$45.83	$213.00
Operating Hours per year	750	750
Annual lamp cost	$25.00	$15.60
Annual power cost— 3c./kw.hr.	$101.25	$42.98
Total annual operating cost	$126.25	$58.58
Total annual cost	$172.08	$271.58
Cost per Foot-candle per Year	$6.88	$6.39

*Amortization based on six years which when interest, maintenance, taxes, and insurance are added amounts to approximately 25 per cent. per year.

It is noted that the first cost of the fluorescent equipment chosen, which is typical, is about five times that of the incandescent. It is true that the foot-candle value from the fluorescent system is about 70 per cent. higher, but even with this greater amount of light, the fluorescent lighting is still not of as good a quality as that produced by the incandescent system. On the basis of the same foot-candle value of 25 foot-candles for the fluorescent, (which cannot be recommended as good practice), the first cost of the fluorescent equipment would be about three times that of the incandescent system.

It should be noted that on the basis of the actual cost per foot-candle the fluorescent system, in the case chosen, works out to be slightly less than for the incandescent system. The operating cost, too, for power and lamp renewals is about one-half. This lower operating cost becomes quite a significant item since it applies for the full life of the lighting system, whereas the first cost is written off either at once, or during the first few years.

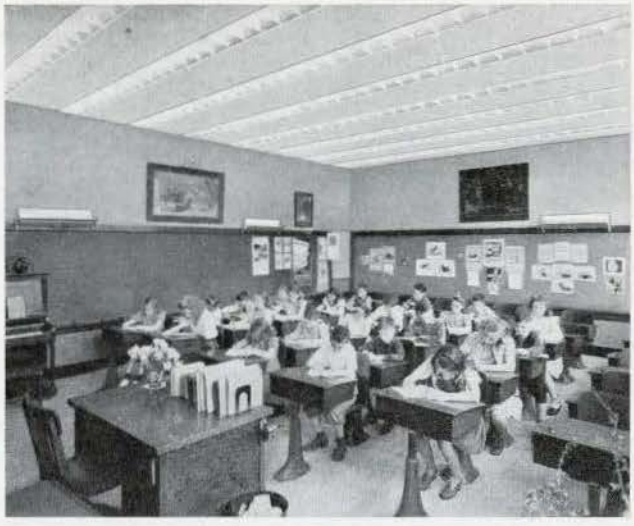
There is the tendency, on account of the relatively high first cost of fluorescent to skimp on the initial installation. When this is done, unsatisfactory lighting results. With fluorescent lighting, this is the chief consideration against which to guard.

Blackboard Lighting

More and more visual instruction is being given in schools. Blackboards have always had an important place in teaching. Often the surfaces and chalk have not been very good, and daylight reflections and inadequate lighting have made seeing difficult. Blackboards, maps and charts need special lighting. Specific lens type units have been designed for this application. Elliptical angle reflectors may be used but have their limitations. The new projector and reflector spot and flood lamps may also suit some conditions.

For this application fluorescent lamps are well suited. These high efficiency elongated sources of low brightness will do an excellent job in suitably designed equipment. So far, due to wartime restrictions, the selection of proper equipment has been limited.

The equipment should be so designed and located that there are no specular reflections of the light source from the top of the board.



Experimental Fluorescent Lighting Installation providing 50 foot candles. Note the germicidal bracket units for destroying airbourne bacteria.

In an ideal situation the blackboards would not be black but light in colour. This might be considered as a part of the whole problem of brightness engineering for optimum seeing conditions.

Room Conditions

A light coloured, preferably white, ceiling with the same colour extended down a few feet on the walls is recommended. The finish should be matte, not glossy. The walls may be of a medium or neutral tone, and the dado darker.

One condition which contributes to poor seeing conditions is the use of relatively dark glossy desk tops. These should be much lighter in colour with a reflection factor around 40 per cent., and non-glossy in finish.

Seeing conditions are also greatly helped by a proper arrangement of window shades, and adjustment of these to suit the varying conditions of daylight. Since the natural illumination on the far side of the room is dependent on the light that comes from the top of the window, one method is to employ two separate shades with the rollers mounted at the middle of the window, one operating downward, and the other upward.

Photo-electric control of the artificial lighting is also worthy of consideration.

The sterilizing of the air in the classroom by means of germicidal units is of a great deal of interest to school authorities.

Six 500 watt totally indirect lighting units in a standard classroom.

ABOUT ACOUSTICS IN SCHOOLS

By G. F. EVANS

Although the School Board and the School Architect were probably not conscious of the fact, they were, none the less, pioneers in the field of noise and acoustics.

No School Board and no School Architect ever selected a noisy location for a school if a more quiet one was suitable and available. They knew instinctively that it just was not the thing to do. Unfortunately, this consciousness of noise on the part of these men ceased after the site had been selected. It ceased primarily, in the years gone by, because there was little or nothing they could do about controlling noise within the school building. This condition has long since changed, however, in that materials are now available to do a splendid job of noise control . . . materials that are structurally suitable and that are satisfactory in every way for the interior surface of any room in a school building, whether it be classroom, cafeteria or swimming pool.

Where limited amounts of money are available, some types of acoustical materials can be had at about the same over-all cost of lath and plaster. Where more money is available, and where a better type of construction is warranted, it is possible to obtain fireproof and waterproof types which permit the elimination of lath and plaster, and which provide dry construction with consequent speeding up of the job. In order to make some definite recommendations for acoustical treatment in school rooms, we will separate the rooms into these general types and consider each type separately to determine whether they require acoustical treatment, and, if so, how much.

The rooms in general can be divided into two main types.

The first, and most important, type is the classroom or teaching room where the spoken word of the teacher must be clearly and distinctly heard and understood by the pupils. If a pupil is deaf, he might just as well not attend classes unless he is a lip reader, and, if he cannot hear on account of faulty room acoustics, he is just as badly off. This is not just a silly example, because there are lots of classrooms where the pupils in the last row, perhaps, have extreme difficulty in hearing.

In an average classroom in a modern building of solid construction with hard bright wall and ceiling finishes, there will be sufficient reverberation to interfere, to some degree, with proper and easy hearing of the spoken word. The reception of speech will be successively improved and diction will become more clear cut with the addition of each succeeding square yard of acoustical material. The ultimate condition would be obtained if the entire wall and ceiling areas were treated.

However, as always, there are other things that must be taken into consideration, and it is obvious that it is not feasible to treat walls because these surfaces are occupied with blackboards, windows, etc. Only the ceiling is available for treatment, and the question arises, of course, as to how much good will the ceiling treatment be. The answer is that efficient treatment on the ceiling only will provide sufficient acoustical correction, that a student will hear a large enough percentage of the syllables or words so that his brain will instinctively and automatically fill in the missing parts with the result that he is actually getting almost 100% continuity and understanding of speech.

If sufficient money is not available for the most efficient treatment of classroom ceilings, by all means put in as much sound-absorbing material as the budget will allow. Auditoriums are in much the same general category as classrooms, although there is a distinct difference because of the difference in size and function. A regard for auditorium acoustics must take into account other features than just the acoustical material. In general, the room should tend toward a rectangular shape and curved surfaces should be avoided. If curved surfaces are necessary or particularly desirable, the radius of curvature should be kept very large or very small to prevent these surfaces from acting as focusing agents which would create bad echo conditions.

So far as the actual acoustical correction is concerned, it is, of course, a well recognized fact that an auditorium of a certain size which is to be used for a certain purpose should have a period of reverberation within very definite limits. The reverberation is controlled by the amount of acoustical material, and this can be calculated and determined quite accurately when the room is in the design stage.

The second general type of room to consider is such rooms or spaces as corridors, cafeterias, swimming pools, etc., where the main consideration is simply the suppression of noise and not the hearing of speech or music. It would seem that there can be no question as to the desirability, at least, if not the necessity, for treatment in these areas. They are at certain times very noisy places. However, the noise in these rooms is perhaps not as serious as faulty hearing in a classroom. The noisy period in a corridor is usually of short duration. It is unpleasant, of course, but it is probable that a doctor would hesitate to suggest that such short exposure would have any harmful effect on the health of a child.

We suggest that acoustical treatment would make these spaces more pleasant and generally acceptable, and that they should be treated to the limit of the budget. The more treatment that is used, the more noise will be suppressed. In general, give first consideration to classrooms and auditoriums where the hearing of speech is essential, and give second consideration to rooms where it is desirable to suppress noise which occurs only during short periods of time.

The final consideration is the elimination of noise caused by mechanical equipment, such as stokers, pumps, fans, etc., that create vibrations which are carried through the building structure. There are numerous methods and devices for isolating all types of equipment and there are materials for preventing noise being carried through air ducts, so that there is little excuse for any mechanical equipment in a school building or any other building to be a source of annoyance.

It has been unfortunate that the school Architect, more than any other, has been perpetually faced with the problem of limited budgets. Invariably he has been forced to make 90 cents do the work of $1.00. This condition, however, very definitely is changing, and the importance of proper school buildings and proper equipment is being recognized by municipalities and school boards, and they are vying with each other to have something more modern and better than the other. The Architect is now having his opportunity of designing and building in the way in which he knows it should be done.

THE PROVINCIAL PAGE

ALBERTA

There can be no doubt that in the hoped-for, beautiful future much must be done about houses of quite modest dimensions. There can also be no doubt in the minds of architects that this question is beset with a host of difficulties. Housing costs too much under our present social and economical set-up. More than one-third of our people just cannot afford, from their own earnings, to build or occupy adequate family dwellings. Vain hopes are spread abroad of vastly cheaper methods of building and more and more wonderful conveniences available to all. In actual fact prices have been steadily mounting through all the time upon which I can look back and there is as yet no hope in sight of their going down. The simplest forms of shelter cost more and more. What use to talk of houses in which doors will open automatically and in which we shall be warmed by unseen sources of heat concealed within the walls, when so many would be glad of a house, if they could get it, without any internal doors at all and thankful to be able to gather close around a central stove? The almost costless house of the future is a dangerous delusion for it diverts attention from the instant needs of our people and the real reasons of their costliness. Suppose the framework of the house could be quite costless, the expense of living in it would still be a heavy burden. The heating and plumbing is, in a small well-equipped house, one-quarter of the cost. Then there is the price of land to consider. To get cheap land the home builder flies to the extreme outskirts of the city and does without proper sanitary conveniences. Closer in, the price of land is prohibitive. The dearer the land the higher the taxes. Water rates, gas rates, heating—all must be currently paid for. If you are to have sidewalks and well-made roads, local rates must be levied. The alternative, and this is quite commonly accepted, is to endure long walks through mud and mire, to pay many car fares and to go to the expense of many out-of-home meals. Citizens who do not pay taxes proportionate to the high speculative prices of land are unwanted, for on that the city depends for the many and ever-increasing services it has to supply.

As for the shape of future houses; I have been looking at illustrations of some of those proposed as temporary expedients in England. In these, whilst various good but minor conveniences for economic housekeeping are introduced, the general plan and arrangement present nothing really new, and this is surely natural. To shelter, feed and generally look after a family, the broad general needs alter only little and slowly. Reduction in sizes adds nothing to comfort and convenience. Cost must still bear some relation to cubic content. The principal hope for saving in these English houses is in the reduction of man-hours spent on the job and some decrease in cost of shop labour by employing mass production, machinery and standardization of parts. Some saving may thus be made but it counts for little in the whole current cost of living.

More than ninety per cent. of houses are built without benefit of skilled architectural advice. Therefore they are inferior both in plan and in general design. To add five or six per cent. to the cost of a small house is not a great tax, but where every little outlay counts it is naturally cut out. The temporary housing now proposed in England is designed by architects with very strict attention to low cost. The designs are decent and conventional as may be expected of a people that stubbornly and, with a basic rightness worthy of better results, refuses to accept pure functionalism stripped of all the beauty that tradition has created and lavished around them. The too moderate degree of it conferred on the proposed housing will only be accepted on the rather dangerous ground that it is only a temporary expedient.

It has become almost axiomatically accepted that for one-third at least of our people, housing must be subsidized. This may be the only immediate course. It does not seem like a sane permanent economic arrangement. Surely something more rational must be looked to as an ultimate solution. I am tempted to venture what is perhaps a vain and rash speculation as to the trend along which some solution may ultimately be reached. Greater efficiency of labour, through better application of labour itself and through mass production, more efficient machinery and more scientific use of materials should be able to raise the amount of production per man. If this could be raised to, say, four times present production, then, other things being equal (which, of course, they will not be), the cost of products would be one-fourth of the present. But let us suppose that meanwhile wages have doubled, prices will even at that be halved; so that the present $5,000 house will cost $2,500. That would be a wonderful help. I do not know what is wrong with this calculation or what is false about this hope. I suspect that a great many things are wrong. But is there any better road along which one may look for better times to come along? Please do not tell me that it is entirely chimerical. I do not wish to despair of the republic.

Cecil S. Burgess.

ONTARIO

The July issue of the *Journal*, if you remember, was graced by a most stimulating set of drawings illustrating a possible replanning of the city of Montreal. It seems rather strange that no one has seen fit to comment in these pages on the theories of Mr. Anthony Clyde Lewis, for it is scarcely possible that the significance of this study should have passed unnoticed by the *Journal's* discerning readers.

Here we have been fussing and stewing* over the so-called major problems of city planning, when actually the whole thing is as simple as ABC. The forthright technique developed by Mr. Lewis and Professor Hilberseimer is capable of application to any set of natural circumstances and practically anyone who is willing to accept the basic principles of this school of thought should be able to replan cities to his heart's content, with all the facility of the man on the f.t.

We all appreciate the fact that a job which can be reduced to a formula becomes ever so much easier. In this case the necessary steps seem to be as follows:

1. Secure a map of the area.

   This should be a simple outline map, preferably without contours as these are unnecessary and might serve to obscure the issue.

2. Determine the direction of the prevailing winds.

   If this information is not readily available, a certain amount of research may be necessary. The time-honoured method of raising a moistened finger is quite reliable, providing the wind is prevailing.

3. Locate the principle elements of the plan.

   First, place heavy industry on the leeward side, indicating this area by a heavy smudge of charcoal. Keeping well to windward of the dirty side, place your main highway and railway line in a convenient position for tying on a series of commercial-residential units, using for this purpose a tracing from the drawings already worked out so admirably by Mr. Lewis. Put in as many of these as you may need for the estimated population, or enough to make a well-balanced drawing.

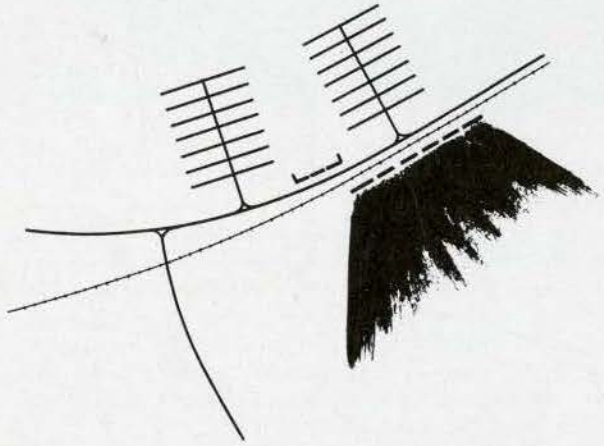
There! The thing is practically done. Of course, it may be desirable to make a set of progressive plans indicating development of the final scheme by 10- or 20-year intervals. Start by showing the existing muddle and take away large chunks of it in each successive drawing.

With a little practice it is thus possible to redesign any given town or city in a very short time. Following the simple steps outlined above, London, Paris or Moscow can easily be taken care of in one afternoon. The accompanying plan of Underdonk, Pennsylvaina, was worked out on the back of an old laundry ticket while waiting for the lights to change at Somerset and Bank. All the essential elements are here co-ordinated with a logic and clarity which compare favourably, I think, with the Montreal proposal.

It is obvious from the foregoing, that out-moded methods of city planning requiring the services of more-or-less expensive professional experts are scarcely justifiable. . .

But wait a minute—surely there must be more to it than that!

The disarming simplicity of the plan is apt to give the unsuspecting reader a bit of a jolt at first glance. On further consideration, however, there does not appear to be any sound reason why such a city should not function perfectly well, in spite of its unorthodox appearance. In this enlightened age we cannot afford to lightly pass over a piece of original design merely because of its unfamiliar forms.



Of course it does seem rather odd that all the residential units should be of an identical pattern, but in fairness to the author we must assume that the necessary adjustments to local topography would be worked out in the final plans.

The utter disregard for all existing features of the Montreal of today is a point of view which may or may not meet with approval, depending upon one's own feelings on the subject. Personally, having lived in Montreal for two years before the war, I am inclined to think that there is some degree of merit in the idea.

Having written the above in a somewhat facetious frame of mind, perhaps I may be excused for ending these remarks on a note of solemnity more appropriate for the pages of a respected professional journal.

The thesis of Mr. Lewis is not, in its fundamental conception, a scheme for the "Replanning of Montreal". It is a plan for an entirely new city to *replace* Montreal, and in this respect in the same class as le Corbusier's projects for Paris, Algiers, and other cities. The Canadian planner of today will be called upon to face the much more difficult and irksome task of reconciling existing conditions with a slow and steady progress toward an ultimate goal.

*I rather like the phrase "mewling and puking" but Shakespeare used it first.

Kent Barker,
Lieutenant (SB) (E) R.C.N.V.R.

QUEBEC

It all comes back to us now! The blame can be directly attributed to our wanton neglect of some practical directions of conduct, proffered by the words of a certain popular lyric, of lowly order and a myriad of seemingly natural circumstances, uncontrollable! We are positive that you will not find the lyric in any known anthology but we recall its warning about sitting under apple trees.

At that time, summer roamed the golden valleys and in languid-lukian mood we mused in the shade. The apples were green and temptations seemed commonplace. In the then prevailing, soaring temperature, we fell for the simple approach and blissfully ignored the surrounding worldly ills. The city streets and slums, the small town main streets, their railroad backs and shacks, the city-folks' country shacks with plumbing lacks, the garbage heaps in none too remote corners, the old bedsprings, parts no longer even spare and so forth! We should have foreseen the dangers of this supine indulgence but the lure of the countryside prevailed. Now the leaf is seared. The apples are down, in boxes, bags, barrels and baskets, in pies and inevitably, as applesauce! Even worse than this, we find among the windfalls, almost reduced to sauce, the once highly-rated low-cost housing schemes for Montreal which we blithely tooted about some months ago.

The 1,000 flats slated for occupancy this Fall, or was it next Spring, are in the discard while the accumulating crisis continues on its uncharted course. It has been hinted that the original promoters have, among other reasons, become discouraged over the inactivity of the City Fathers in creating the legislation necessary for realization. Elections are drawing nigh and existing property owners, well represented at the Hotel de Ville, have never taken kindly to the proposed tax exemptions, designed to benefit the low-cost schemers. Indeed they countered with a swift demand for a corresponding reduction on all property taxes, without distinctions, on the not unreasonable basis of—sauce for the L.C.'s being sauce for the P.O.'s. This impasse of course helps no one and still leaves the field wide open to the rampant jerry-builder with speculative inspirations and architectural imagination of Disney-an heights, while citizens with limited paying abilities continue among the goats, both figuratively and alas, in reality. Professional loss being discounted! All this is more or less on the inside but outside the city borders housing is represented by plain chaos. Where the hand of authority is absent or light, unplanned, unrestricted communities arise like weeds, particularly around transportation limits. These uprisings would seem to indicate just what some citizens think of inner-circle conditions and while their efforts are to be commended, the results in too many cases, arouse only compassion. At the

same time we have a suspicion that the situation is by no means peculiar to this district! Main highways are being lined with the pernicious ribbon developments and if a Regional Plan for Montreal is not forthcoming soon, these growing snags may possibly result in complete future frustration. As for the low-cost housing problem in general, one thing in particular has always surprised us, namely, the seeming inability of Labour to do more and at the same time better, in the way of providing its own shelter.

When one considers the amount of coin furnished annually by workers to Labour Unions for divers purposes—highly paid executives, strike benefits, etc., etc., it is strange that the Housing of Labour has not received more attention from Unions. In our ignorance, we have often thought of what might be accomplished in the way of a financial background, if each Union member on the continent subscribed an extra dollar per week towards a fund for Housing Salvation! After all subsidy is only another name for other people's money and if our Labour can afford to be independent in so many other respects, why not in this National need?

Collective bargainers might note, while we dash for the shallow-end! Although it has already been mentioned in our other language, local satisfaction is widespread over the civic decision to take the Montreal City Building Code off-the-cuff as it were. Hopes are entertained for the special committee now busily engaged in the necessary cleaning and pressing task.

By way of plausible excuse and we suspect, may be for the sake of "Auld Lang Syne", the P.Q.A.A. Reconstruction and Town Planning Committee braved the almost forgotten dog-days, met and discussed the Montreal Railway situation as academically outlined by Anthony Clyde Lewis in the July *Journal*. Unfortunately the meeting was forced to agree with his findings and his words brought little solace. "The first step in the solution of this difficulty is the consolidation of railroads and highways in one parallel system with a central terminal." Quite so! and we forget how many times we have heard these words in the past but how late is too late? However, while the modern amenities and glamour of our obviously self-centred new terminal are being gradually accepted by the populace, other old ills continue unchecked. Suburban trains continue to operate on our streets. Just how this will ever be cured is still a mystery to us. Travelling twice over the Canal, it now takes fifty minutes to reach St. Anne's from the new C.N.R. station while the C.P.R. gets there easily in thirty. In this situation how can the former compete in time, unless Bonaventure remains as it does, where it is and suburban trains continue to run over the ancient level crossings. We had always hoped the old would disappear with the advent of the new and Windsor Street straighten itself out with great advantage to street traffic, but there are as yet no visible signs of this dream's fulfilment. It may be that time and convenience are minor factors in our railway tangle, or are we just impatient?

The proposed city subway system is stirring again as well as a scheme for a new bridge to the south shore, arranged to by-pass the antique Victoria Span with its tolls! One of the last two remaining toll bridges in the Province. We have suggested that Engineer Williamson's tunnel scheme might be dusted-off to advantage but from the general tone of things it looks as if too many commitments have already been made in the direction of another round-about bridge. In either case, however, south shore development has been retarded too long through lack of proper speedy access and our hopes are with its residents.

From Quebec City we note with interest, which should be general, the creation of a committee, committed to co-ordinate the Town-Planning work of municipalities and county councils, proposed by the new Minister of Municipal Affairs. This should have a familiar ring in the ears of the P.Q.A.A. group which presented recommendations to the Provincial Government on T.P. Enabling Acts, etc., in other days. In spite of the fact that there is another party now in office which might alter the former circumstances, it is, perhaps, a favourable sign, notwithstanding the change in colour. We can still hope but to do so eternally, in a case of this kind, is asking too much.

What a Fall, but in reverting to our opening theme we might say, that in local professional circles apple sauce is less evident than might possibly appear from the foregoing.

Perhaps it is due to the lifting of lighting restrictions; perhaps other welcome influences are responsible, but nevertheless, the fluorescent gleams from many office windows, reflected in Autumn skies, could be the GO signs—"green lights" on anticipations!

J. Roxburgh Smith.

CONTRIBUTORS TO THIS ISSUE

Karel R. Rybka, M.E., D.Sc., M.E.I.C., is a graduate of the University of Prague with a Doctor's Degree in Science. He has been in charge of the Toronto Office of Walter J. Armstrong, Consulting Engineer, for the past nine years, and is considered an authority on heating and ventilating.

J. W. Bateman, M.I.E.S., B.A.Sc., University of Toronto, Past-President of the Toronto Section of the Illuminating Engineering Institute, Registered Professional Engineer, and has been with the Canadian General Electric Company Limited for many years as Manager of the Lighting Service Department, dealing with all lighting and engineering problems.

G. F. Evans, B.A.Sc., University of Toronto, Registered Professional Engineer, Member of the Acoustical Association of America. Has been with the Canadian Johns-Manville Company Limited as Acoustical Engineer for twenty years.

OBITUARY

LIEUTENANT DAVID L. COWAN

The *Journal* prints with sincerest regrets the news that one of Canada's promising younger Architects was killed in action in France on October 2nd, 1944. Lieutenant David L. Cowan was born on November 3rd, 1910. He attended the School of Architecture at the University of Toronto; after two years he transferred to the University of Manitoba, from which he graduated in 1934 with the degree of Bachelor of Architecture. After graduation he returned to his native town of Guelph, Ontario, to practise architecture. In February, 1941, he enlisted with the Royal Canadian Artillery, and eventually went overseas.

David Cowan belonged to that small group of which any profession or country may be proud: although only thirty-three years old, he had acquired a practical philosophy of humanism. He believed in freedom, and it was characteristic of him that he gave his life fighting for the ideals in which he had faith. He is remembered by his friends as a gentle spirit, and a good fellow.

A. Wasson-Tucker and Wm. H. Gilleland.

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character. We had always hoped that upon graduating we could turn to you for more of that confidence and ambition with which you instilled us while studying at McGill. But now that you've left us we want you to know that we'll really miss you.

Not only us but all your students with whom you came into contact while serving as a member of the Staff for 33 years. We, and they, want you to know that we respected you as a professor but loved you as a father.

We'll never forget you. Fond memories linger on into eternity.

Architectural Class of '43,

Sid Lithwick.

OBITUARY

FRANCIS B. REILLY

The Saskatchewan Association of Architects lost one of its Charter Members by the death of Francis B. Reilly at Regina recently. Mr. Reilly was Past President of the Association and for a period of years held the post of Secretary-Treasurer.

At one time Mr. Reilly's firm had branches at Moose Jaw and Swift Current and over the years designed many fine public and private buildings.

A prominent Mason for many years, Mr. Reilly was grand master of the Masonic Lodge of Saskatchewan in 1932-33. He was grand scribe E of the Royal Arch Masons of Saskatchewan since its formation in 1923, and was provincial prior and grand constable of the Grand Priory of Canada.

Mr. Reilly's passing will be regretted by his many friends and colleagues.

Robert F. Duke.

CONTRIBUTOR TO THIS ISSUE

Lieutenant (SB) (E) Kent Barker, R.C.N.V.R., graduated from the School of Architecture, University of Toronto, in 1936. While at the School of Architecture he won the O.A.A. Scholarship, the Architectural Guild's Silver Medal, the R.A.I.C. Medal, and the Darling and Pearson prize. Immediately following graduation he was awarded the Langley Scholarship, which he used to spend a year at the Cranbrook Academy of Fine Art studying town planning under Mr. Saarinen. Prior to his enlistment, early in the war, he was with Canadian Industries Limited, Montreal, and latterly in the Architectural Department of The Canadian Broadcasting Corporation.

BUILDING MATERIALS STANDARDS

The first of a series of building material standards to be issued by the Canadian Standards Association are now available, and may be obtained from the Canadian Standards Association, Ottawa, at the prices mentioned.

A82-1—1944—*Building Brick (made from Clay or Shale). Price 50 cents.*

Three grades of brick, made from clay or shale and burned and intended for use in brick masonry, are covered in this specification. The requirements include physical properties, size and coring, inspection, sampling and testing, and there are explanatory notes on colour and texture, compressive strength and durability.

A82-2—1944—*Standard Methods for Sampling and Testing Brick. Price 50 cents.*

Procedures for the sampling and testing of brick for modulus of rupture (flexure test), compressive strength, absorption, saturation coefficient and effect of freezing and thawing, are contained in this specification.

A82-3—1944—*Sand-Lime Building Brick. Price 50 cents.*

The scope of this specification covers brick made from sand and lime, to be used in brick masonry, and there are requirements for grades, physical properties, size and visual inspection, sampling and testing.

A82-4—1944—*Structural Clay Load-Bearing Wall Tile. Price 50 cents.*

This specification for structural clay load-bearing wall tile made from surface clay, shale, fireclay, or mixtures thereof, and covers two grades of tile, as follows: Grade LBX suitable for general use in masonry construction and adapted for use in masonry exposed to weathering; Grade LB suitable for general use in masonry where not exposed to frost action. Explanatory notes on colour and average weights are given.

A82-5—1944—*Structural Clay Non-Load-Bearing Tile. Price 50 cents.*

One grade of tile is specified in this standard for structural clay non-load-bearing tile (partition, fire proofing, and furring) made from surface clay, shale, fire clay, or mixtures thereof. The requirements include absorption, weights, permissible variations in dimensions, scoring, marking, inspection and testing.

A82-6—1944—*Standard Methods for Sampling and Testing Structural Clay Tile. Price 50 cents.*

Procedures for the sampling and testing of structural clay tile for weight determination, compressive strength, absorption, and freezing and thawing, are covered in this specification.

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